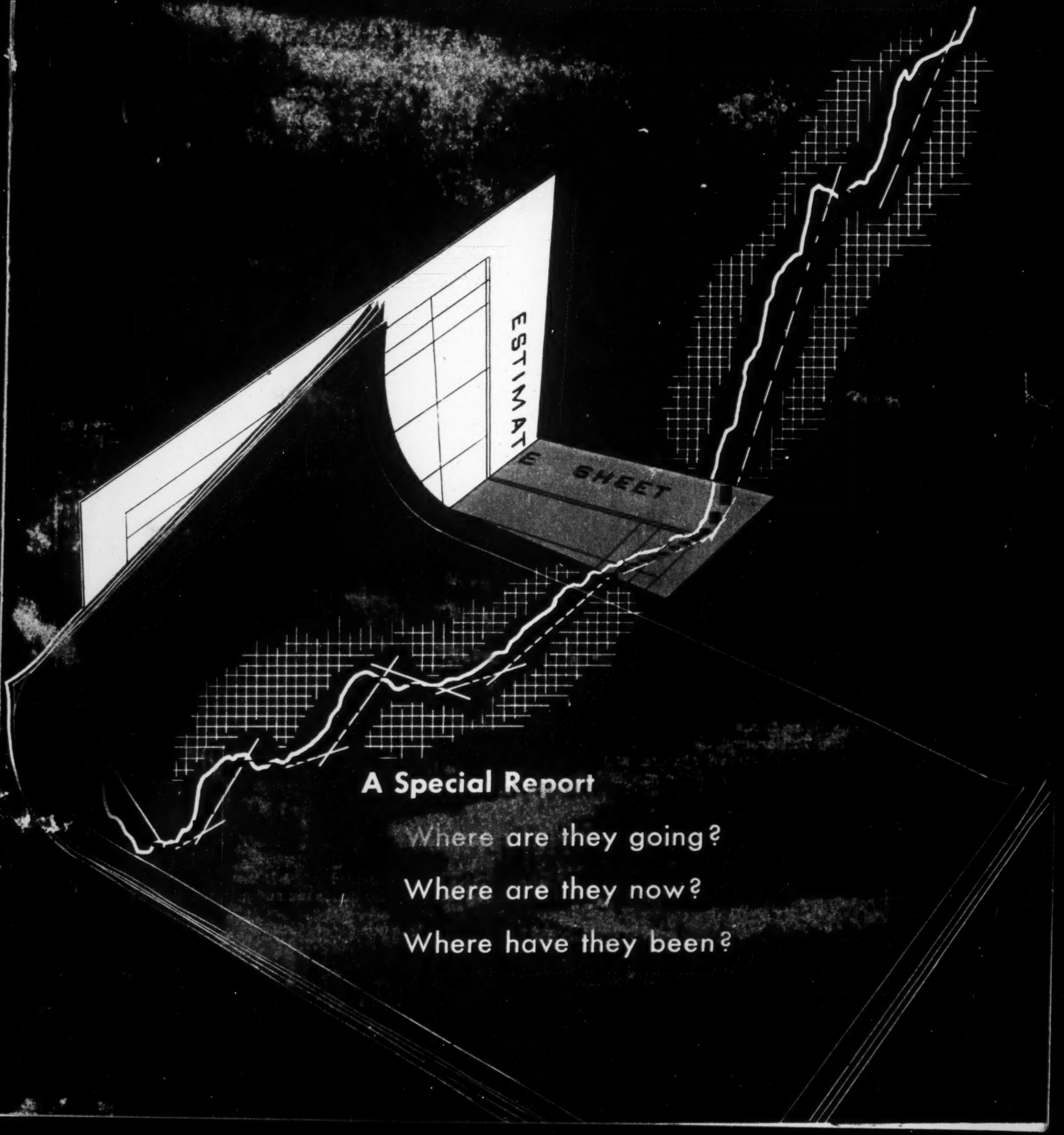
ENGINEERING NEWS-RECORD

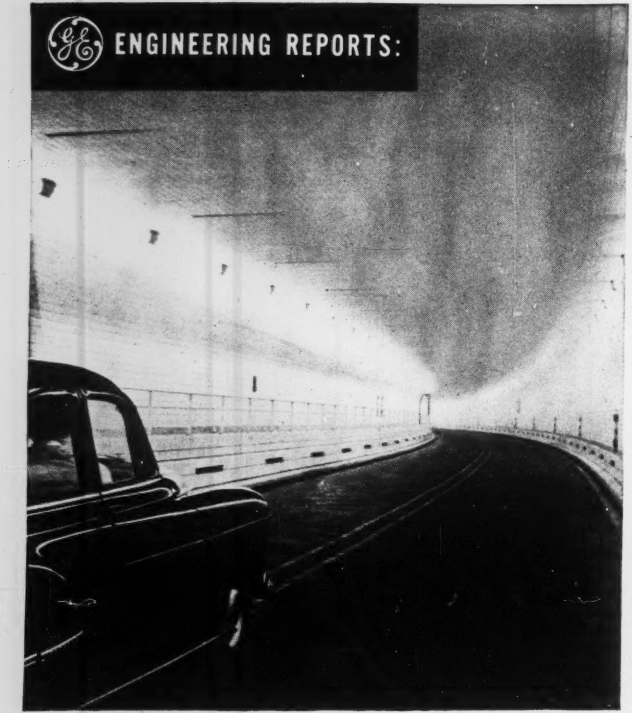

ESTIMATE SHEET

A Special Report

Where are they going?

Where are they now?

Where have they been?



CONTINUOUS-LINE FLUORESCENT LIGHTING—key feature of Brooklyn-Battery electrical system—gives safer, shadowless illumination. Variable light intensity and lower operating costs are other important features.

Ribbons of light mean safer, lower-cost tunnel operation

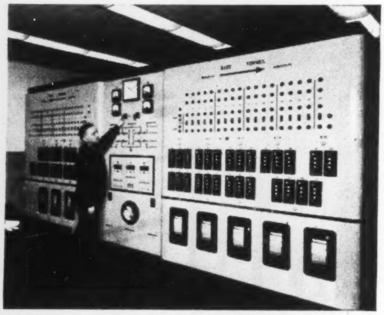
Fluorescent lighting, central control, reliable power highlight G-E system at Brooklyn-Battery Tunnel

Now handling 16,000,000 vehicles a year with safety, comfort, and operating economy, New York's Brooklyn-Battery Tunnel provides an excellent example of modern tunnel electrical systems. Designed by engineers of the Triborough Bridge and Tunnel Authority and General Electric, this electrical system was the first to feature economical, variable-intensity fluorescent lighting. Centralized control and a coordinated power distribution system also contribute to operating economy and dependability.

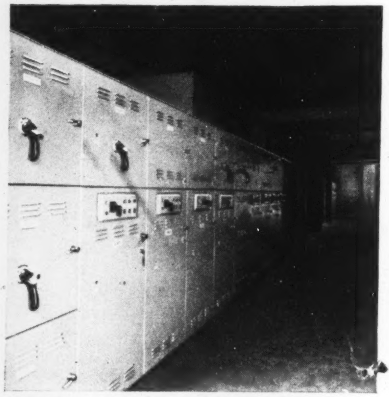
Tunnels are just one of the many types of heavy construction projects on which General Electric is ready to assist your engineers or consultants in electrical system planning. Contact your local G-E Apparatus Sales Office. General Electric Co., Schenectady 5, N. Y.

664-24

WELL-LIGHTED APPROACHES lead to tunnel. In daytime, lighting inside the entrance is brighter to provide better transition from sunlight.



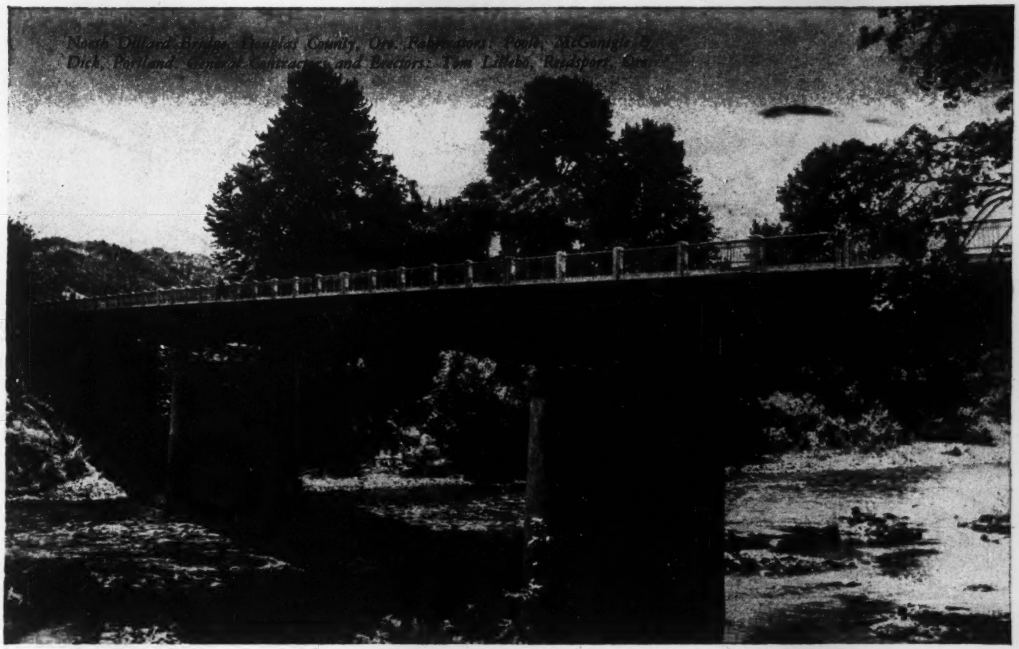
CENTRALIZED CONTROL permits one man to operate the complete electrical system—lights, fans, pumps and safety equipment.



RELIABLE POWER—a necessity for tunnels—is provided by G-E metal-clad switchgear. G.E. also builds fan and pump drives for tunnels.

Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC



North Dillard Bridge, Douglas County, Ore. Fabricators: Poole, McGonigle & Dick, Portland. General Contractors and Erectors: Tom Lillebo, Reedsport, Ore.

MAYARI R

Replaces Last Timber-Truss Bridge on Pacific Highway

The last of the old timber-truss bridges, once common along the Pacific Highway, has given way to a new deck-girder structure built largely of Mayari R. Spanning the South Umpqua River about 9 miles below Roseburg, Oregon, this bridge is another example of the increasing structural use of low-alloy, high-strength steel.

The bridge consists of 3 continuous-plate-girder spans and 2 reinforced-concrete approach spans. The total length is 504 ft. The floor beams, stringers, girder webs, girder-flange angles, girder-cover plates, and splice material are Mayari R. These parts were designed on the basis of 27,000 psi in tension, which allowed a substantial reduction in the deadweight of the bridge.

Weight-saving is only one of the advantages provided by Mayari R. Besides having almost double the yield point of the structural carbon grade, Mayari R also has 5 to 6 times as much resistance to atmospheric corrosion. It retains paint up to 80 pct longer. It has better resistance to abrasion and impact. And it can be fabricated by the usual methods employed for carbon steel. It is used in the as-rolled condition, without heat-treatment.

For further information about the structural uses of Mayari R, including suggested stresses for bridge design, write for a copy of Catalog 259.

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BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

Mayari R *makes it lighter... stronger... longer lasting*

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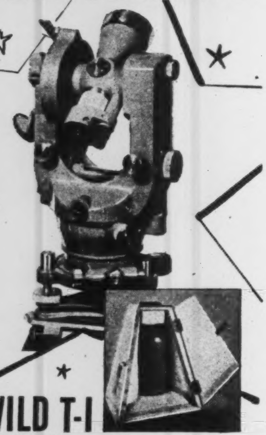

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The right combination of features makes for increased accuracy and greater speed.

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ENGINEERING NEWS-RECORD

ABP Member ABC

Volume 149 September 4, 1952 No. 10

WALDO G. BOWMAN
Editor

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37th Annual Report on Construction Costs 79

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Municipal
Meetings
Book Reviews
Construction Reports
Material Prices
New Products
Men and Jobs
Labor
Business and Finance

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ROBERT F. BOGER
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Member ABC and ABP

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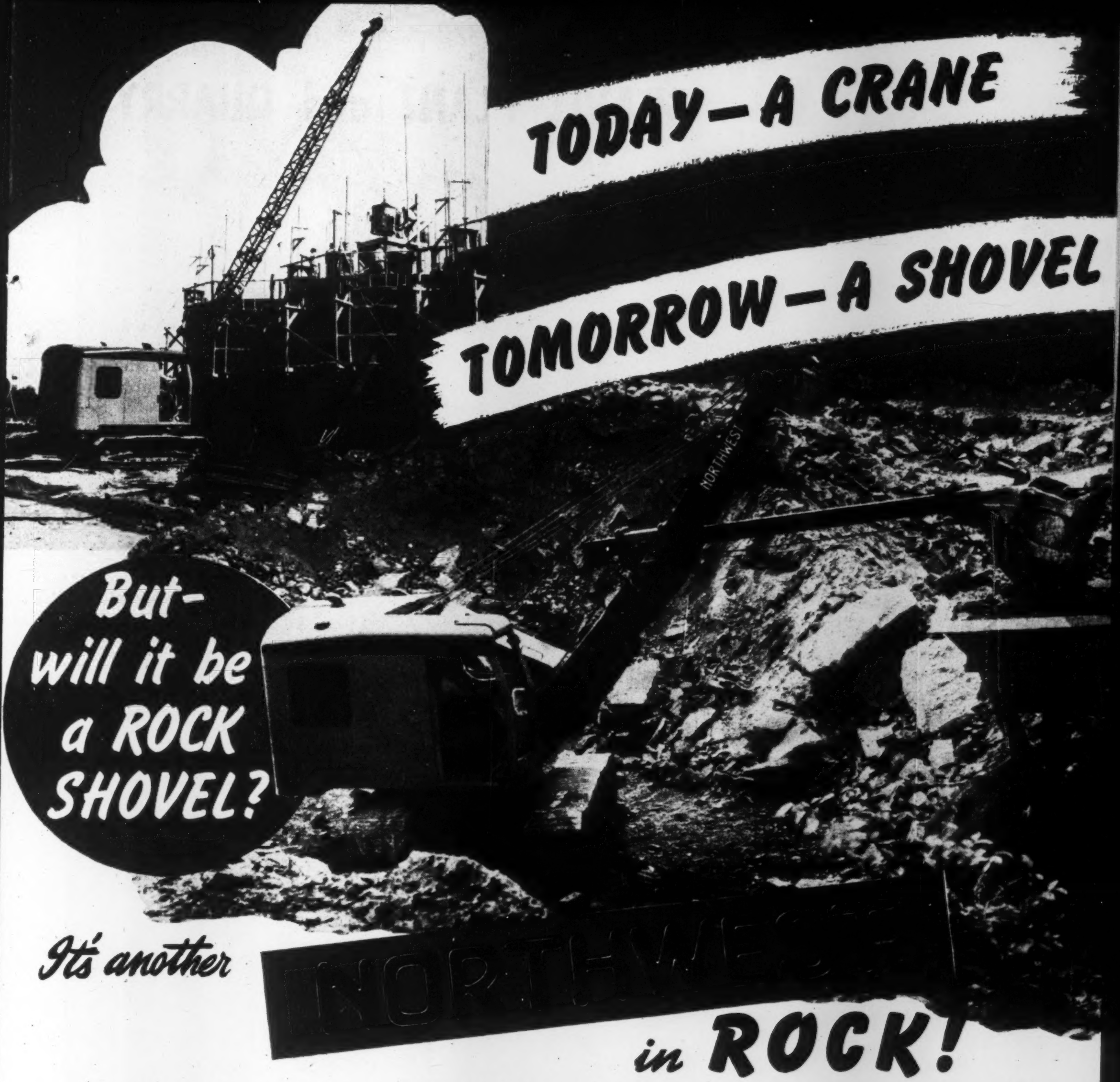

There are always tougher jobs ahead! Today you start in with crane operation. Tomorrow you may be faced with a shovel problem and conversion of your equipment. What kind of a shovel is *your* crane going to make? Will it be a Rock Shovel?

If you have a Northwest you know what it will be. You've probably proved it to be a *real* Rock Shovel just as so many Northwest owners have. High output in rock is one of the many reasons why one out of every three Northwests sold is a repeat order.

Remember, the boom doesn't make the machine. Real convertibility is a combination of *basic machine* and attachments—a combination of basic materials, design, balance, engineering—all the tangible and intangible qualities that come only with years of testing and experience.

Be sure when you buy your Shovel, Crane, Dragline or Pullshovel that you will get the *best* in performance no matter what boom you mount on it.

Better check into Northwest convertibility.

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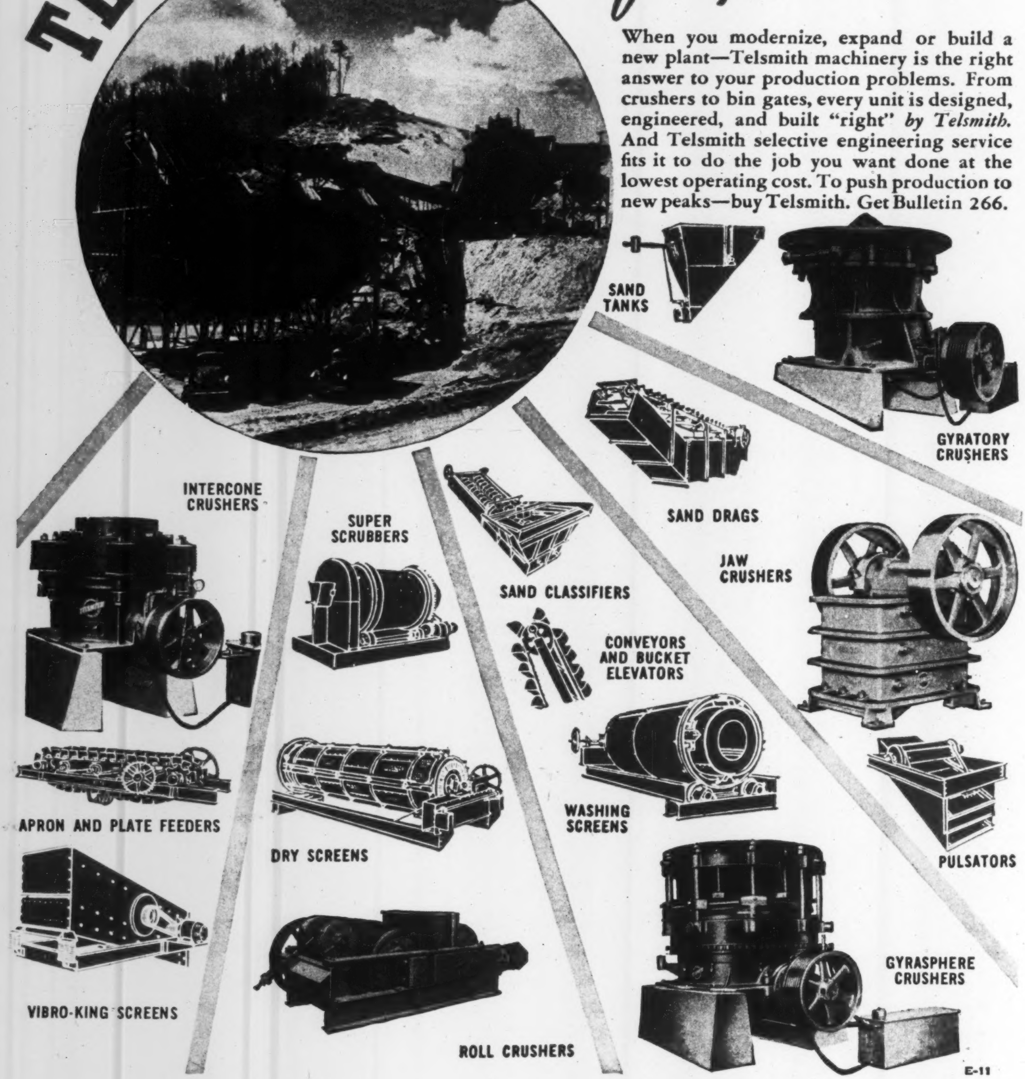
When you modernize, expand or build a new plant—Telsmith machinery is the right answer to your production problems. From crushers to bin gates, every unit is designed, engineered, and built "right" *by Telsmith.* And Telsmith selective engineering service fits it to do the job you want done at the lowest operating cost. To push production to new peaks—buy Telsmith. Get Bulletin 266.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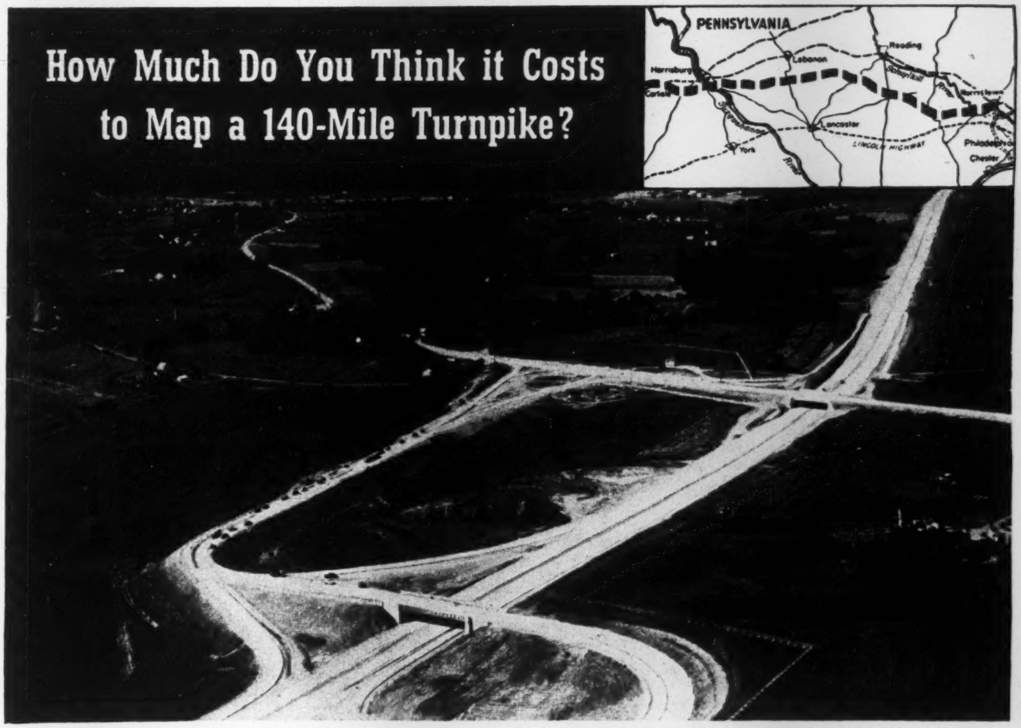
How Much Do You Think it Costs to Map a 140-Mile Turnpike?



☐ **$278,000** ☐ **$83,000** ☐ **$415,000**

The right answer, of course, depends on how the mapping is done. The record shows the right answer for most large scale projects is economical AERO mapping. You can save time and money with dependable AERO surveys, whether your project is a turnpike . . . locating pipe lines or power lines . . . planning a mining development or dam site location . . . selecting a railroad route . . . or planning for city growth or any big industrial expansion.

AERO, the pioneer and leader in aerial photo-mapping, has the experienced men and equipment to do a job for you. Call in AERO engineers at the planning stage of your next large project.

Which figure did you check?

☐ $83,000 for Aero Service mapping for a 1-mile wide route strip, with 5 ft. contours, done in 145 days. Pennsylvania Turnpike engineers said ground surveys would have cost $415,000 and taken 2½ years.

"All preliminary line and grade studies, interchange layouts, grade separation studies, quantity estimates and cost estimates were based on these topographic maps," say the Turnpike designers. *Ask us for Frank J. Williams' important Engineering News-Record report on this work.*

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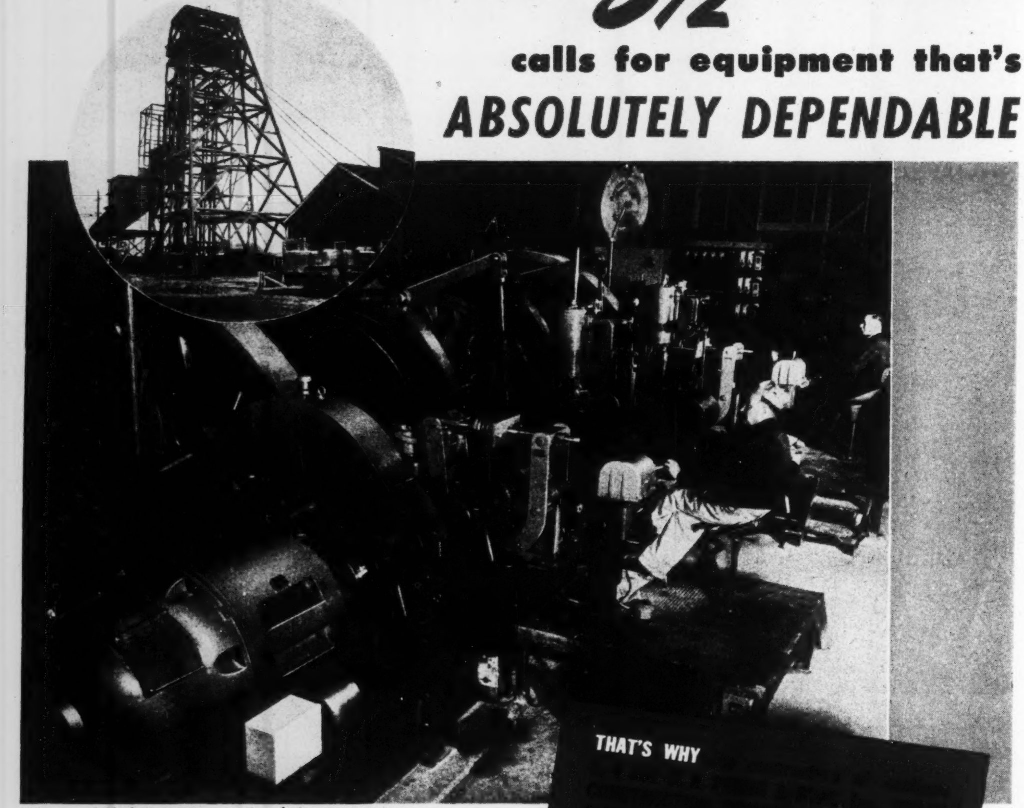
calls for equipment that's

ABSOLUTELY DEPENDABLE



Lidgerwood Shaft Hoists in operation during construction of the hydraulic pressure tunnel for Ontario Hydro's Sir Adam Beck-Niagara Generating Station No. 2.

THAT'S WHY

[illegible]

6 LIDGERWOOD SHAFT HOISTS

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Because the job calls for absolute dependability, the contractors are relying on six LIDGERWOOD SHAFT HOISTS to raise an estimated 1,200,000 cubic yards of muck from 16,130 lineal feet of the 45′ diameter tunnel. These hoists will raise and lower men, equipment, steel and other supplies, so they *must* deliver top performance. LIDGERWOOD SHAFT HOISTS are a product of the 200 years of combined experience of the SUPERIOR-LIDGERWOOD-MUNDY CORPORATION.

For descriptive literature write to:

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The happy little Eskimo has POWER STEERING ...why not modern trucks?

"The happy little Eskimo,
He rides upon his sled.
His dogs outstrip the winds that blow
Across the gleaming ice and snow
Beneath the northern lights that glow
Like silver overhead."

Words of song by Frederick Manley,
© Silver Burdett Co., by permission.

As the dog team rushes the sled along, the animals furnish the power for steering. The Eskimo just shouts the arctic equivalent of "gee" or "haw" and the dogs turn the sled accordingly. The Eskimo doesn't have to wrench a steering wheel.

Even when "gleaming ice and snow" are with us, we don't use sleds for transport. But in eliminating primitive haulage, we have lost the power steering. The far heavier manual steering load is on the arm, shoulder and back muscles of the driver. The resulting fatigue causes him to slow down, become less efficient, more prone to accidents.

Vickers Hydraulic Power Steering makes the heaviest vehicle safe and almost effortless to steer . . . even under the most adverse conditions (ruts, soft shoulders, obstructions, flat tires, off-road, etc.). A light finger touch on the wheel is enough . . . steering is no longer a source of driver fatigue. Drivers remain fresh, efficient, safe.

Get further information on Vickers Hydraulic Power Steering; ask for Bulletin M-5100.

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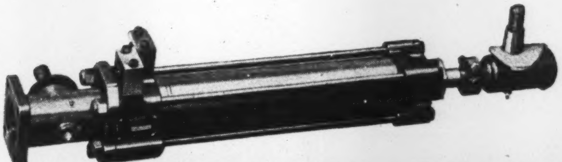

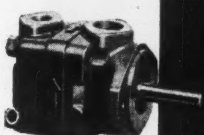

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gives HIGHER OUTPUT—

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Dozing — With hydraulic torque converter drive you take full advantage of available horsepower . . . roll bigger loads, tackle tougher dozing jobs. Master clutch engages under cushioned protection, yet power is achieved *instantly* with velvet-like smoothness. This means fewer repairs . . . longer life of tractor and auxiliary equipment.

Pulling — There's nothing like the HD-20 for sheer productive power. Torque converter actually multiplies torque up to four and one-half times . . . develops tremendous drawbar pull to start the load smoothly, and automatically accelerates to highest speed conditions permit, in either high or low range.

Excavating — With full horsepower available even at creeping speed, and shifting virtually eliminated, the operator can concentrate on his front-end shovel completely . . . crowd surely and steadily . . . start and stop with a touch of the throttle.

Pushing — The HD-20 makes smoother contact, automatically matches speed to pushed equipment, maintains steady contact while loading, sends load off to the fill in a higher speed.

Get the full story now from your Allis-Chalmers dealer. See why the HD-20 does more work, more easily, at less cost . . . and why it is worth waiting for.

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Weight: 41,000 lb.
175 Net hp.
at flywheel

— with LESS UPKEEP
Originator of the Torque Converter Tractor

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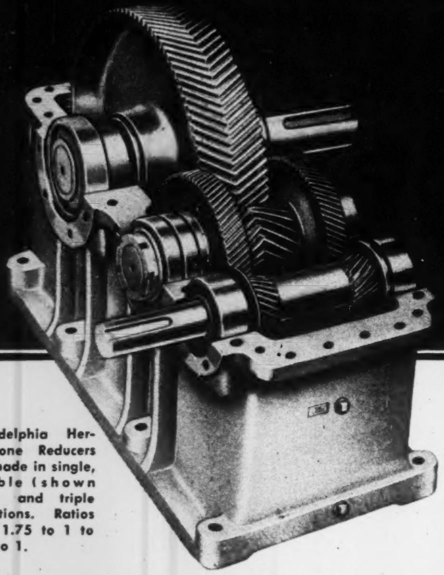

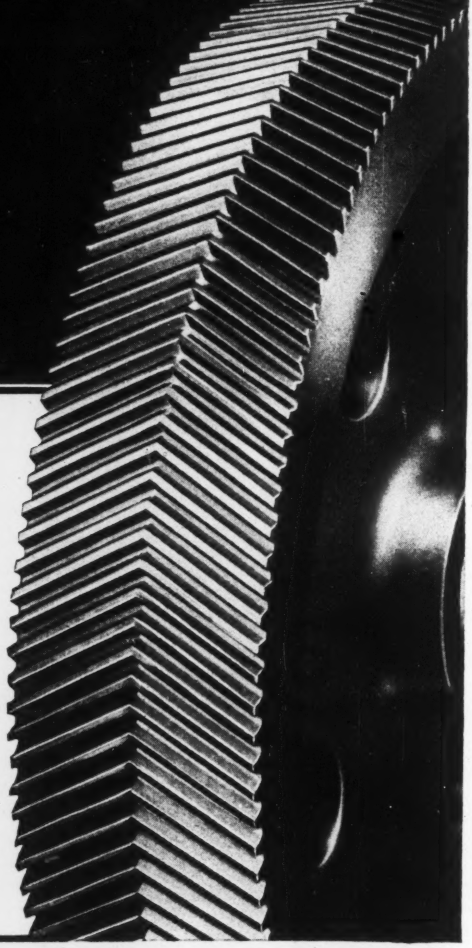

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As a unit of a "standard line", the Philadelphia Herringbone Gear Speed Reducer cannot be excelled. Its superiority of design and workmanship reaches the heights of custom built quality . . . yet every part is "standard".

Of the hundreds of Units passing through the shop, the majority may look alike, yet each Unit is handled as a *special assignment*. Built right into it, are the specific service characteristics that will deliver the required power with maximum efficiency, economy, durability and minimum maintenance.

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Write on your Business Letterhead for Catalog H49.

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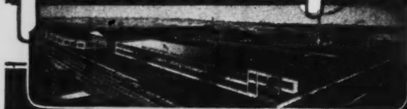

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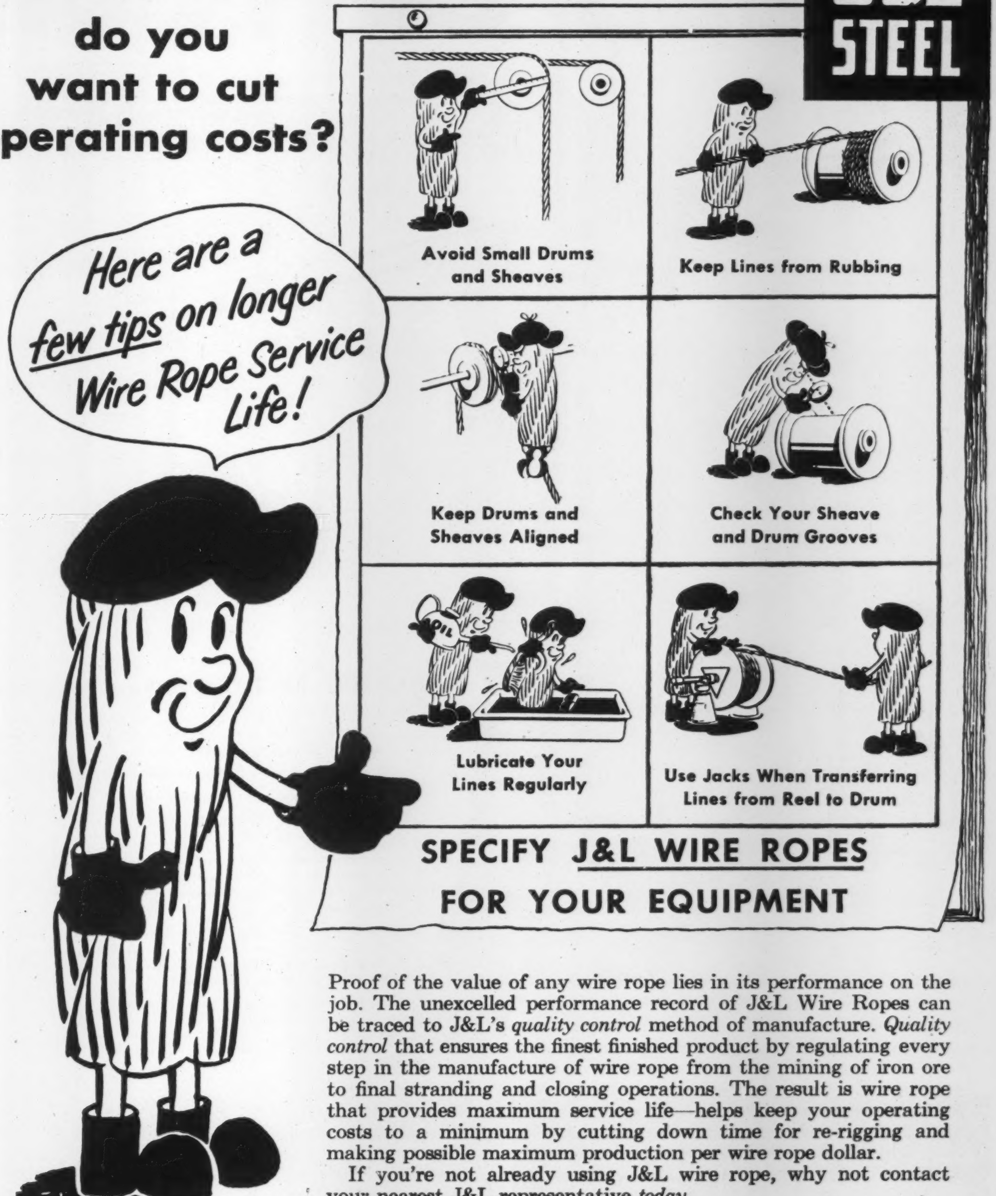
do you want to cut operating costs?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Here are a few tips on longer Wire Rope Service Life!
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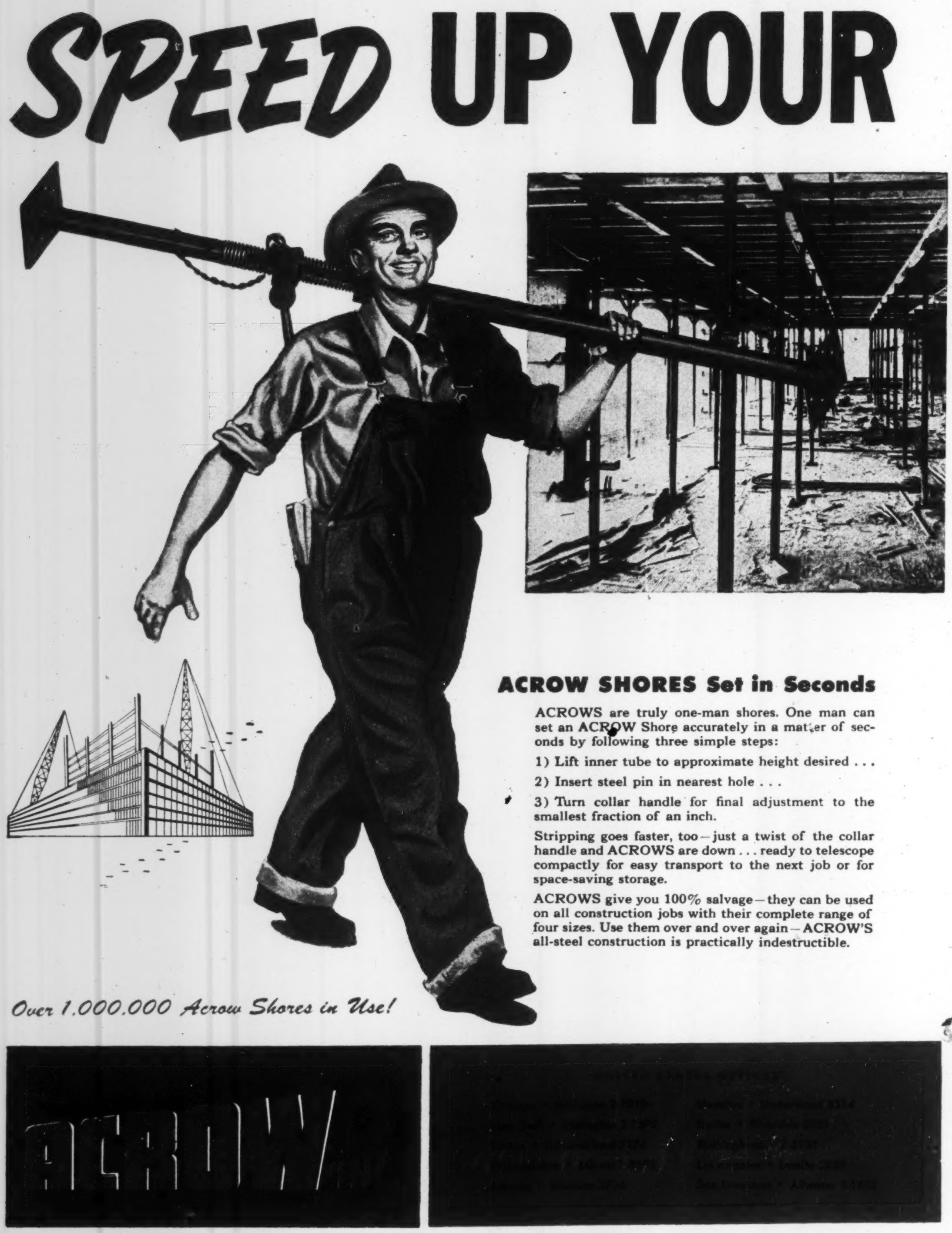

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ACROW SHORES Set in Seconds

ACROWS are truly one-man shores. One man can set an ACROW Shore accurately in a matter of seconds by following three simple steps:

1) Lift inner tube to approximate height desired . . .

2) Insert steel pin in nearest hole . . .

3) Turn collar handle for final adjustment to the smallest fraction of an inch.

Stripping goes faster, too — just a twist of the collar handle and ACROWS are down . . . ready to telescope compactly for easy transport to the next job or for space-saving storage.

ACROWS give you 100% salvage — they can be used on all construction jobs with their complete range of four sizes. Use them over and over again — ACROW'S all-steel construction is practically indestructible.

Over 1.000.000 Acrow Shores in Use!

ACROW

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Houston • Underwood [illegible]
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Birmingham • [illegible]
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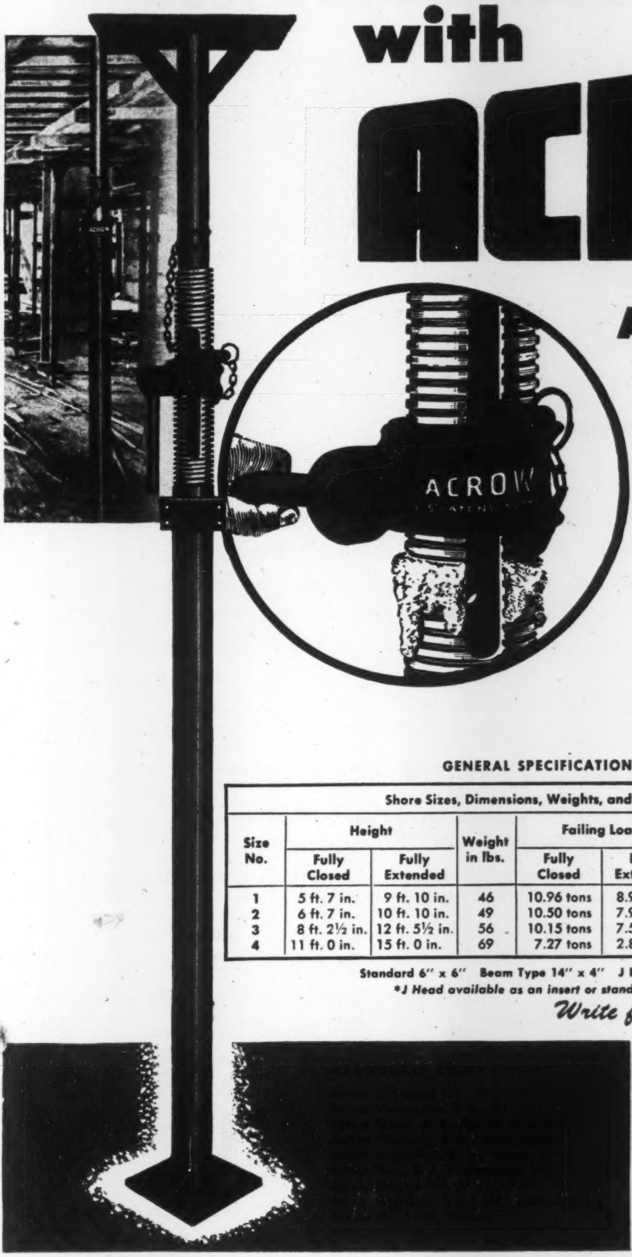
CONSTRUCTION with ACROW



ADJUSTABLE STEEL SHORES

ACROW Steel Shores are engineered and built from base to head for the fastest, safest, securest support on the job. Completely positive simple action leaves no chance for slippage. There is no cutting, wedging, or nailing to eat up time and money. And ACROW Shores have no jacks, levers, or supplementary tools to lose.

EXCLUSIVE ACROW SELF-CLEANING FEATURE makes possible rapid stripping operations. A unique patented extension of the collar nut extends over a segment of the threaded tube (see left). When collar handle is turned in stripping operation, encrusted concrete, dirt, and grit are removed from the thread—making ACROWS instantly ready for use on the next job.

GENERAL SPECIFICATIONS

Shore Sizes, Dimensions, Weights, and Capacities

Size No.	Height		Weight in lbs.	Failing Load		Recommended Safe Working Load	
	Fully Closed	Fully Extended		Fully Closed	Fully Extended	Fully Closed	Fully Extended
1	5 ft. 7 in.	9 ft. 10 in.	46	10.96 tons	8.97 tons	8210 lbs.	6720 lbs.
2	6 ft. 7 in.	10 ft. 10 in.	49	10.50 tons	7.90 tons	7840 lbs.	5975 lbs.
3	8 ft. 2½ in.	12 ft. 5½ in.	56	10.15 tons	7.55 tons	7490 lbs.	5600 lbs.
4	11 ft. 0 in.	15 ft. 0 in.	69	7.27 tons	2.89 tons	5225 lbs.	2050 lbs.

Standard 6" x 6" Beam Type 14" x 4" J Head 14" x 4"*

***J Head available as an insert or standard head.**

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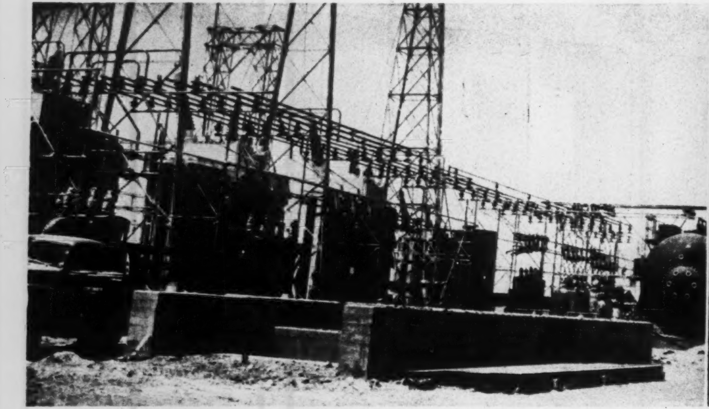
City __________ Zone ______ State ______

Hydropel Integrally Waterproofs Concrete Best in Competitive Tests



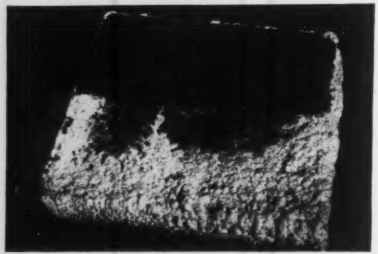
(Top left) HYDROPEL CONCRETE foundations, Pacific Gas & Electric Company—Midway Steam Plant.

(Top right) PLAIN CONCRETE in same location—showing effect of alkali soils.

PRODUCT	% CAPILLARY ABSORPTION*
ADDITIVE A	8.93
ADDITIVE B	10.60
ADDITIVE C	8.05
ADDITIVE D	8.75
ADDITIVE E	10.19
ADDITIVE F	6.06
ADDITIVE H	10.23
PLAIN CONCRETE (5½ sack)	8.10
AIR ENTRAINED CONCRETE (5½ sack)	7.80
HYDROPEL (5½ sack)	**1.09**

**2" x 4" Cylinder of minus 3/8" material, specimens dry at 140° F.*

TEST RESULTS as tabulated by Pittsburgh Testing Laboratory show comparative capillary water absorption after seven days.



HYDROPEL BLOCK *(top half)* absorbed little of the salt solution in which it was placed till all had evaporated. Air-entrained concrete *(lower half)* sucked up the solution, leaving destructive salt crystals throughout.

OF ALL WATERPROOFING PRODUCTS, Hydropel® integral admix for concrete ranks highest. Pittsburgh Testing Laboratory proved this in exhaustive tests. Concrete treated with eight major competitive products actually absorbed from five to ten times more moisture than Hydropel-treated concrete. The Pittsburgh technicians also proved Hydropel accomplishes waterproofing *without loss of strength.*

All types of construction benefit:

PAVING ENGINEERS—can build concrete pavements without destructive volume changes due to moisture.

ARCHITECTS—can specify—and get—basement concrete that remains warm and dry—assuring owner-satisfaction.

INDUSTRIAL PLANTS—can have concrete that lasts 4 times longer in bad alkali and moisture conditions.

CONTRACTORS—can, at last, deliver quality concrete for tough places at low premium cost.

Send for free illustrated descriptive booklet

HYDROPEL®

AMERICAN BITUMULS & ASPHALT COMPANY • 200 BUSH STREET, SAN FRANCISCO 4

FORD POWER TRIMS COSTS

from every angle!

CHOOSE FROM 6 GREAT ENGINES

Designed for Heavy-Duty Industrial Use

- Any way you figure, there's profit in Ford Industrial Power . . . profit for equipment manufacturers through lower engine prices, and profit for operators through lower *operating* costs.

Ford Power for your equipment is RIGHT 3 WAYS: The *Right Power* is available in your choice of 6 engine series from 120 to 317 cu. in. displacement. The *Right Features* through availability of a complete line of special equipment and accessories for all requirements. The *Right Service*, too, is always as close as the nearby Ford Dealer who carries the more commonly purchased replacement parts that help cut "downtime" to a minimum.

Write for literature offered in coupon below. Our experienced Sales Engineers are also at your service in developing recommendations for the most efficient use of Ford Power in your application.

FORD'S POPULAR "120" *Complete* POWER UNIT

The **"BLITZER"** 7-Gang Mower above is manufactured by the Worthington Mower Company, Stroudsburg, Pa., who selected this widely adopted Ford "120" 4-cyl. Power Unit because of its most efficient, economical operation.

Ford

INDUSTRIAL ENGINES
AND POWER UNITS

When selecting or changing engines . . . whether it be in construction work, in mining and oil field operations, in logging and lumbering, agriculture or the thousand-and-one industrial needs . . .

YOUR JOB IS WELL POWERED WHEN IT'S FORD POWERED!

Coupon brings specific information — MAIL IT TODAY!

INDUSTRIAL ENGINE DEPARTMENT
FORD MOTOR COMPANY, 15050 Woodward Ave., Highland Park 3, Mich.

WE ARE INTERESTED IN INDUSTRIAL POWER FOR:

____
(state your application)

Send us 1952 Literature on Ford Industrial Engines checked below:

☐ "120" 4-Cyl. ☐ "215" 6-Cyl. ☐ "239" V-8 ☐ "254" 6-Cyl.
☐ "279" V-8 ☐ "317" V-8 ☐ "MULTA-TORQUE" Converter

FIRM NAME______________________________
(Please Print)

STREET______________________________

CITY__________________ZONE________STATE__________

A

First* in the Field and still the Best

*In self-propelled scrapers, Wooldridge was first to introduce positive hydraulic steering and air-operated power unit with fingertip remote controls—achieving new speed and ease of operation and eliminating jack-knifing hazards . . . first to set new higher production standards with such features as boiling bowl loading, positive pivot-tilt ejection, rear draft fulcrum leverage, and independent control of all scraper functions . . . first with air brakes, 24-volt electrical system, spring-loaded pusher button, massive oscillating king pin, to name a few of many engineering advances.

WOOLDRIDGE

Since the first Terra Cobra revolutionized earthmoving practices through introduction of entirely new design principles, each year has brought new Wooldridge engineering improvements. Pioneering developments, the result of long specialized job study and experience, have been incorporated to bring greater owner satisfaction and lower hauling costs. That's why the new TC-S142 Terra Cobra is today the ruggedest, simplest, easiest to maintain, most productive machine in the field. Watch its faster loading and dumping, get the operator's story on its easy handling, compare its true pay load capacity, and check its low down time records. We think you'll rate the Terra Cobra best in the field—by far! Why not get all the facts today from your Wooldridge Distributor.

WOOLDRIDGE TERRA COBRA

model TC-S142

17.5 cu. yds. heaped

WOOLDRIDGE

WOOLDRIDGE MANUFACTURING COMPANY
Sunnyvale, California • 5345 N. Winthrop Ave., Chicago 40, Ill.

BUILT FOR MORE PRODUCTION PER HOUR—MORE HOURS OF PRODUCTION

AUTOMATIC INTERMITTENT FEEDING

BY-PASS FEEDERS

MECHANICAL CHEMICAL PUMPS

MOTOR OPERATED CHEMICAL PUMPS

AUTOMATIC CYCLE CONTROL

WATER TESTING CABINETS

FLO-CONTROL VALVES —TIMERS

Dearborn has the
ENGINEERED EQUIPMENT
for your water treatment

Before you specify the water treatment and feeding system on your next job, consult with Dearborn . . . specialists in this important field since 1887.

Here Dearborn will help you meet the exact requirements of your customers' specifications. After basic analysis, your Dearborn Engineer will recommend and furnish the necessary equipment, the proper treatment, permanent test control procedures.

Why not take advantage of this specialized experience to save time, trouble and money. A Dearborn Sales Engineer is anxious to consult with you and your engineering department.

DEARBORN CHEMICAL COMPANY
Merchandise Mart Plaza • Chicago 54, Illinois

WRITE FOR THIS VALUABLE BOOKLET

Bulletin 5000, which completely describes Dearborn's Industrial Water Treatment and Engineering Service, should be in your files. A copy will be sent promptly on receipt of the coupon.

Dearborn Chemical Company, Dept. ENR,
Merchandise Mart Plaza, Chicago 54, Ill.
☐ Send me a copy of Bulletin 5000
☐ Have a Dearborn Sales Engineer Call
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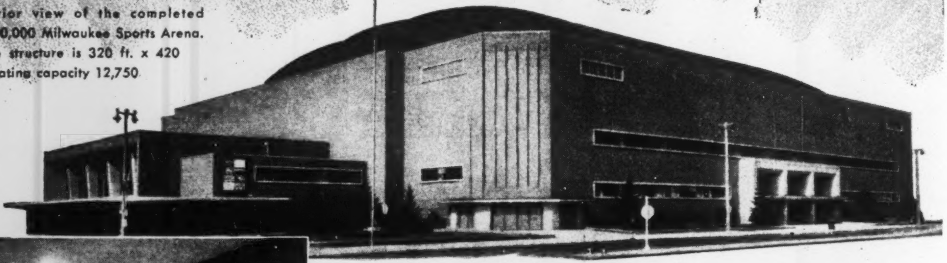
Company......................................
Position.......................................
Address.......................................
City.................. *Zone*.... *State*...........

Dearborn
TRADE MARK REGISTERED
THE LEADER IN WATER TREATMENT AND RUST PREVENTIVES

Build with Concrete Masonry and You Build for PERMANENCE!



Exterior view of the completed $5,000,000 Milwaukee Sports Arena. Entire structure is 320 ft. x 420 ft. Seating capacity 12,750

Interior view of Sports Arena lobby. Note the beauty of exposed concrete masonry walls.

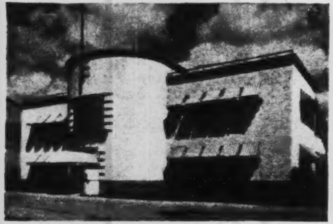
New Milwaukee Sports Arena is a Modern Example of Economical, Fire-Safe Masonry Construction!

In building the Milwaukee Sports Arena, the contractors were faced with the problem of achieving permanent, fire-safe construction at LOW COST. Concrete Masonry solved the problem. All units, including concrete brick, were produced on Besser Vibrapac machines.

Concrete Masonry units are used for all types of structures, such as hospitals, schools, skyscrapers and other public buildings. To the permanence of concrete are added such features as comfort, beauty, architectural flexibility, insulation against heat and cold, acoustical and soundproofing qualities, plus ECONOMY.

Write for free copy of bulletin illustrating standard Vibrapac concrete masonry units and ask for name of Vibrapac-equipped plant in your area.

BESSER MANUFACTURING CO., Alpena, Michigan, U. S. A.

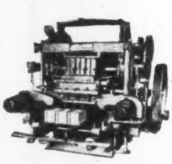


Concrete Masonry constructed club house at the Michigan State Fair Grounds.

Concrete Masonry is ideal for super service stations.

BESSER VIBRAPAC

— the fully automatic concrete block machine. Sets the pace for modern production and handling devices. Produces high quality masonry units, of any desired texture and density, at the lowest possible cost.



Parochial School built with concrete block. Fire-safe. Storm-safe. Permanent.

BESSER

BATCH MIXERS — SKIP LOADERS — BLOCK & BRICK CUBERS — SUPER VIBRAPAC — SINTERING PLANTS — ACROW CENTERS — ROOF TILE MACHINE

COMPARE
Added Values
5 NEW HEAVY-DUTY HOISTS
10 to 31-ton capacity

New

Class	Model	Wt. lbs.	Payload tons rating at body lengths shown									
			7′	8′	9′	10′	11′	12′	13′	14′	15′	16′
Standard Duty 4 new models	D-16	550	7¼	6								
	H-16	650		9								
	H-18	735			9	8	7					
	H-20	795			11½	10	9	8				
Heavy Duty 5 new models	L-20	870			14	12½	11	10	9			
	L-24	1020				15	13½	12	11	10		
	2H20	1370				20	18	16	14½	13	11½	
	2L20	1555				25	22	20	18	16½	15	13½
	2L24	1695				31	28	25	23	21	19	17

Note: 6 new conversion hoists for platforms also available.

Up to 22% more payload capacity per dollar!

Tear out this ad . . . compare St. Paul's *new* capacities and prices with any other hoist in the market . . . you'll find St. Paul gives you far more earning capacity for your money.

15 to 50% lower mounting costs!

No chassis interference, adjustable mounting clips, pre-drilled long beams, dash mounted controls, combine to give you "lower installed costs" with St. Paul.

Up to 300 lbs. less dead weight per unit!

St. Paul's new uni-flex sub-frame with thrust-equalizing tension bars and equi-lift strut arms assure more strength with less "beef" . . . less strain on truck chassis.

Better performance . . . less maintenance!

Better leverages, lower pump pressures, replaceable bushings are just a few of many performance advantages you get in the new St. Paul Hoists and Bodies.

GET THE COMPLETE STORY

St. Paul
HYDRAULIC

ST. PAUL HYDRAULIC HOIST
Customer Service Department
36117 Main Street, Wayne, Michigan

Name______________________________
Position______________________________
Company______________________________
Address______________________________
City____________________ State__________

Rush free booklet describing new St. Paul hoists and bodies.

"John, this building of mine holds a cost-cutting *Tip-Off* from ONE BUSINESSMAN TO ANOTHER"

"*What is it?*" asked John, a prominent appliance manufacturer.

The contractor answered, "*Simply this: don't take your fasteners for granted!*

"*An RB&W man showed me how a switch in fasteners could help me make field connections much more economically.*

"*He suggested switching from rivets to high strength bolts. They cost more than rivets initially, but the assembled cost is much lower. My men work faster than with rivets. The building goes up faster.*"

You, too, can find a cost-cutting lesson from this story, whether you're in construction* or any other industry.

MORAL: Look to your fasteners for an often overlooked opportunity to reduce costs, and strengthen your competitive position. New inventions, like RB&W's SPIN-LOCK Screw, may prove more efficient than the fasteners you're now using. Or you may save by the stepped-up production you get from using the finest fasteners . . . RB&W bolts, screws, nuts and rivets of uniform accuracy, dependability and physical properties.

Let RB&W help you make the most efficient use of fasteners on your assembly line. Address RB&W at Port Chester.

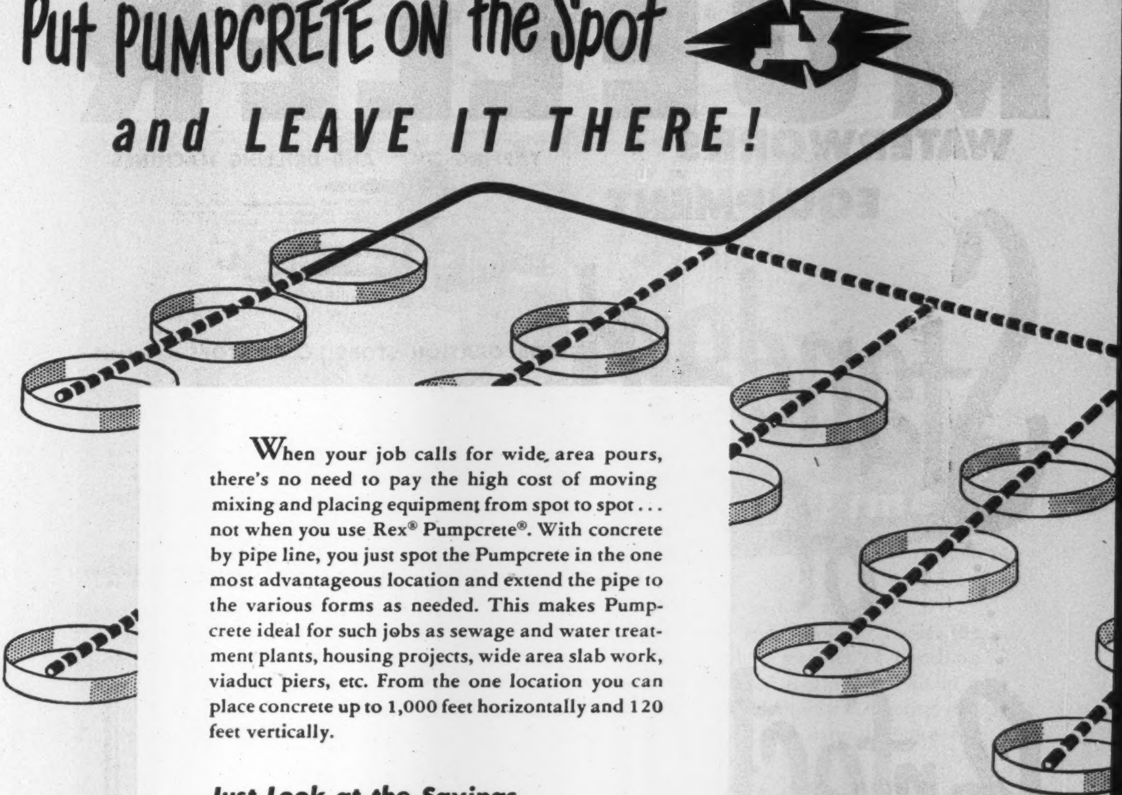
RB&W—The Complete Quality line. Plants: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices: Philadelphia, Pittsburgh, Detroit, Chicago, Dallas, Oakland. Sales agents: Portland, Seattle. Distributors from coast to coast.

RUSSELL, BURDSALL & WARD
BOLT AND NUT COMPANY

*If you're interested in construction, write RB&W at Port Chester for a free reprint of the recent article, "No More Riveting."

RB&W 107 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

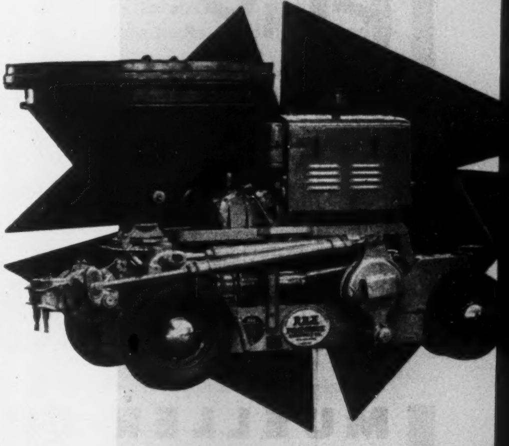
Put PUMPCRETE ON the Spot and LEAVE IT THERE!



When your job calls for wide area pours, there's no need to pay the high cost of moving mixing and placing equipment from spot to spot . . . not when you use Rex® Pumpcrete®. With concrete by pipe line, you just spot the Pumpcrete in the one most advantageous location and extend the pipe to the various forms as needed. This makes Pumpcrete ideal for such jobs as sewage and water treatment plants, housing projects, wide area slab work, viaduct piers, etc. From the one location you can place concrete up to 1,000 feet horizontally and 120 feet vertically.

Just Look at the Savings

- **No moving of heavy equipment from place to place**
- **Eliminates preparatory roads, trestling, towers, scaffolding, etc.**
- **No buggies or buggy runs**
- **No runway storage problems**
- **No cleanup problems**
- **No interference with various crews**



Investigate today the savings concrete by pipe line can mean for you. Get the details from your local Rex Distributor or write to Chain Belt Company, 4633 W. Greenfield Ave., Milwaukee 1, Wisconsin.

CHAIN BELT
REX®
COMPANY

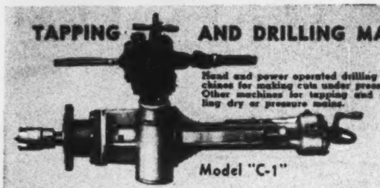
CONSTRUCTION MACHINERY . . .

MUELLER®

WATERWORKS EQUIPMENT

Standard of Perfection

TAPPING AND DRILLING MACHINES



Hand and power operated drilling machines for making cuts under pressure. Other machines for tapping and drilling dry or pressure mains.

Model "C-1"

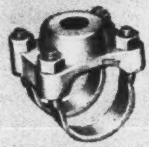
CORPORATION STOPS

No. H-10001

For machine insertion under pressure. Many patterns for use with cast iron, steel, asbestos cement or wood mains and service clamps.

CURB STOPS No. H-10201

Inverted key and solid head patterns. Complete selection of types. Precision made.



SERVICE CLAMPS No. H-10496

Available in single or double strap styles. For mains up to 13". For steel, wrought iron, cast iron or asbestos cement pipe.

TOOLS H-10680

A wide variety of hand-forged tools, skillfully heat-treated and ground.

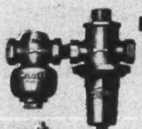
METER SETTING EQUIPMENT

No. H-14000
Meter Yoke

Variety of meter yokes: copper yoke, single bar, straight line types, plus swivel and angle stops and test valves.

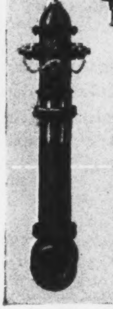
SERVICE BOXES

Telescoping extension-type service boxes Minneapolis Pattern or Arch Pattern. Wide range of lengths and sizes.



REDUCING & REGULATING VALVES

No. H-9000 Full line of pressure reducing, regulating and relief valves, in many styles, sizes and capacities. For hot and cold water, oil, steam, gas.



GATE VALVES

Designed and built to exceed AWWA specications.

FIRE HYDRANTS

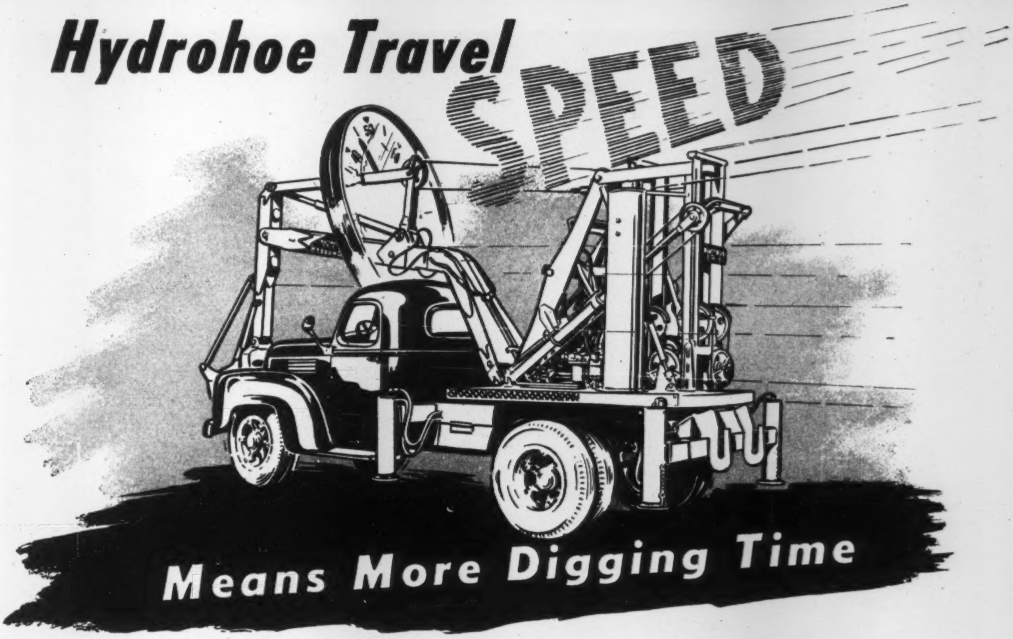
MUELLER CO. offers you a complete selection of waterworks distribution equipment, supplies and specialties designed and manufactured to the high standards of quality and perfection that have characterized Mueller products for 95 years. Write for catalog information on any of these product lines.

MUELLER CO.

Dependable Since 1857

MAIN OFFICE & FACTORY DECATUR, ILLINOIS

Hydrohoe Travel SPEED



Means More Digging Time

This fast-stepping, all-hydraulic Bucyrus-Erie Hydrohoe moves in traffic as easily as your automobile — zips along open highway at speeds up to 50 mph — sets up in three to four minutes — and is ready to take off in equally short order after the job is finished.

Telescoping boom is fully retracted and fits snugly over cab on a strong brace when in travel position. There's no unwieldly extension sticking out to slow down the Hydrohoe — or imperil other traffic. Notice the crane's low super-structures — this speedster slips right through underpasses as low as 12 ft.

With such speed and agility in traffic, the Hydrohoe can handle a number of trenching jobs at widely separated locations — all in a day. In addition, the Hydrohoe's superior maneuverability makes it the natural choice for close quarter digging.

Speed is only one of many Hydrohoe advantages. Equally important is the way the hoe can be converted to crane front-end in the field in as little as four man-hours. Send the coupon for full details.

BUCYRUS-ERIE HYDROCRANE DIVISION

SOUTH MILWAUKEE, WIS.

Here is the Hydrohoe in action. Every work function fully hydraulic. Available with 18- or 12-inch wide dipper. The only dragshovel with *TWO SEPARATE DIGGING ACTIONS!* The first is the conventional dragshovel digging arc. The second—a leveling and smoothing stroke — is obtained by telescoping the boom.

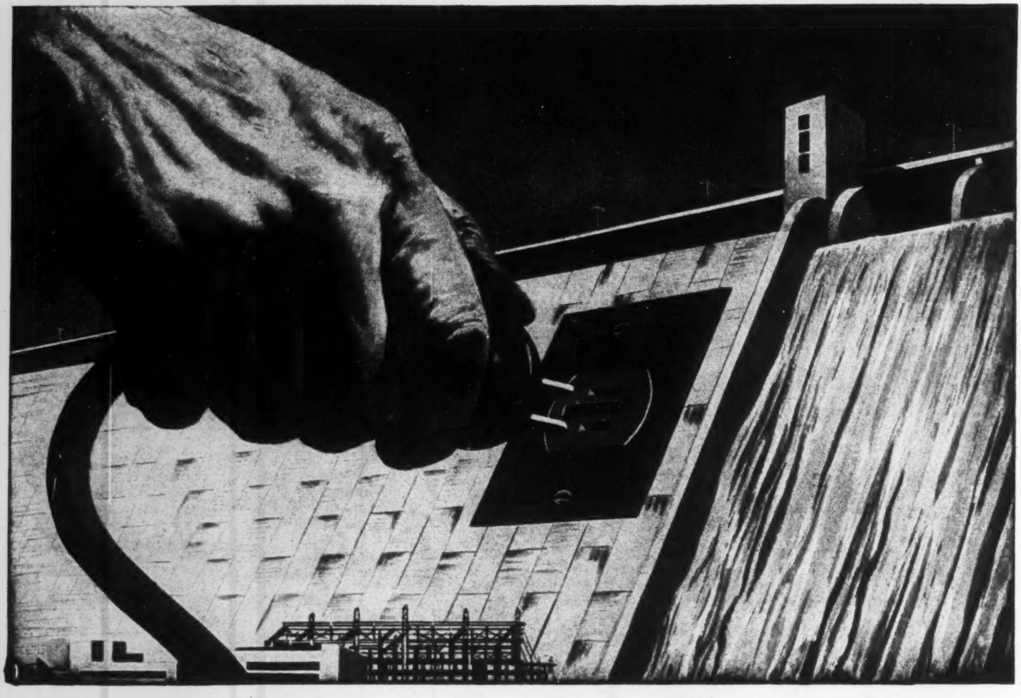
BUCYRUS ERIE HYDROCRANE

South Milwaukee, Wisconsin

☐ Please send Hydrohoe literature.
☐ I am interested in a demonstration.

Name..
Company..
Address..
City...State.......................

152H52



An Idea You Can Plug In Anywhere

The approach employed in solving this important construction problem—for one of the world's largest power dams—may hold an idea for you . . .

In this case, provision had to be made for a temporary but effective water stop that could be removed after the turbines and pumps were installed.

To accomplish this, the penstocks as well as pump inlet pipes were designed with hemispherical bulkheads in the up-stream sections, making it possible to install the lower sections of the penstocks during periods of high water. Also, bulkheads were incorporated in the downstream ends of the pump intake pipes, to protect the pumping plant after the reservoir was filled. For essential design freedom, adaptability and strength for a static head of 270 feet of water, as well as economy, bulkheads were made of steel plate formed shapes. This construction also permitted their easy removal by flame cutting after the pumping units had been installed.

Sound answers like this in any field come from cooperative development between the engineering staffs of progressive Equipment Builders . . . engineers . . . and materials suppliers. These experienced builders regularly turn to Lukens for its knowledge of materials, as well as its wide range of specialty steel plate, heads and steel plate shapes.

For names of such Equipment Builders, write us today, explaining your problem. Manager, Marketing Service, 513 Lukens Bldg., Coatesville, Pa.

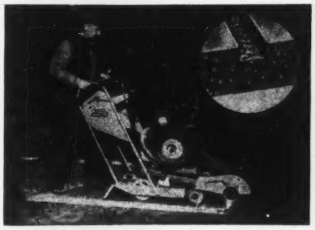
LUKENS STEEL COMPANY

WORLD'S LEADING PRODUCER OF SPECIALTY STEEL PLATE · PLATE SHAPES · HEADS · CLAD STEELS

CONSTRUCTION EQUIPMENT NEWS

A Preview of Equipment That Will Help You On the Job

PATCHES—TRENCHES SAWED FOR FLOOR—STREET REPAIR — Saw concrete floors, walks or streets! Saw narrow slit trenches 1" wide for conduit or any width for utility lines. Eliminate jackhammer fractures beyond the straight, smooth sawed lines.—**Write Clipper Mfg. Co., 2812 S.E. Warwick, Kansas City 8, Mo.**

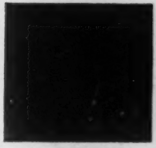


FLOORS, DRIVES, RUNWAYS EASILY CUT FOR REPAIRS—Rail tunnels, rail and pipe trenches, air lines and machinery bases were cut in dense concrete with a Model C-130 Clipper Concrete Saw and CDS-20 Diamond Blade at the rate of 5' per minute—3" deep. Tremendous savings were claimed by the contractor in removal and replacement.—**Write Clipper Mfg. Co., 2812 S.E. Warwick, Kansas City 8, Mo.**

TRACK SAW NOW CUTS LARGEST STONE, TRANSITE, TERRA COTTA — By placing C-15 Clipper Concrete Saw on tracks, a Cleveland contractor cut limestone veneer units from 15'x7"x15" quarry lengths. In addition to large, bulky shapes this model is efficient and dustless for inside patch and trench work.—**Write Clipper Mfg. Co., 2812 S.E. Warwick, Kansas City 8, Mo.**

CONTRACTION JOINTS NOW SAWED—Floors, walks, drives and runways now poured continuously (reduces bulkheading!) Then joints are sawed to eliminate hand forming and costly spalling.—**Clipper Mfg. Co., 2812 S.E. Warwick, Kansas City 8, Mo.**

STUDIES OF SAWED JOINTS PROVE VIRTUAL ELIMINATION OF SPALLING — Highway transverse joints sawed 2" deep are devoid of spalling after 1½ years in contrast to heavy spalling in a few weeks on formed joints, according to State tests.



Typical spalling after few weeks heavy traffic.

Sawed joints on same highway after 1½ years.

It's Done Easier, Faster, More Economical when you SAW BEFORE BREAKING with

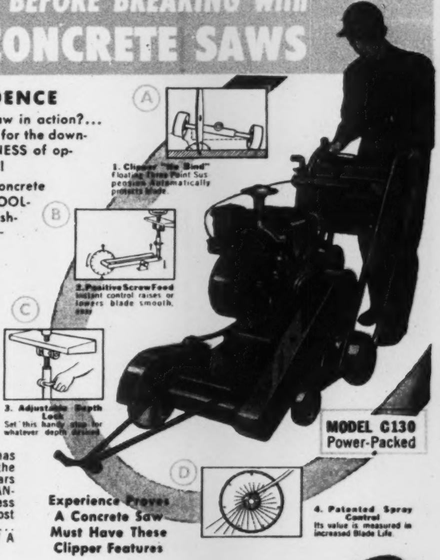
CLIPPER CONCRETE SAWS

CONCRETE EVIDENCE

Ever watch a Clipper Concrete Saw in action?... If not you've missed something... for the downright SPEED, EASE and SMOOTHNESS of operation is really something to see!

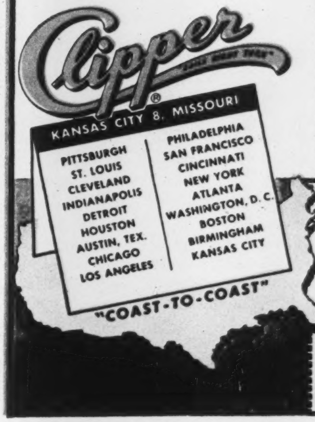
You'll recognize that Clipper Concrete Saws are designed for SIMPLE, FOOL-PROOF DUSTLESS performance. Dashboard controls—perfect balance—floating three point blade suspension* — and "job-rated" power plants...all combined for concrete and asphalt cutting far beyond anyones expectations.

*A pivoting front axle keeps the blade straight in the cut even on rough surfaces—stops binding — stops excessive blade costs.


A
1. Clipper "No Bind" Floating Three Point Suspension Automatically protects blade.
B
2. Positive Screw Feed Instant control raises or lowers blade smooth, easy
C
3. Adjustable Depth Lock Set this handy stop for whatever depth desired
MODEL C130 Power-Packed
D
4. Patented Spray Control Its value is measured in increased Blade Life
Experience Proves A Concrete Saw Must Have These Clipper Features

FREE TRIAL...

The outstanding policy of FREE TRIAL has been in effect since Clipper invented the World's First Masonry Saw many years ago! Clipper Concrete Saws are GUARANTEED to: Provide—regardless of hardness ...the Fastest Cut...at the Lowest Cost ...with the Greatest Ease...Anytime... Anywhere! You be the judge...TRY A CLIPPER ON FREE TRIAL!



Clipper®

KANSAS CITY 8, MISSOURI

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ST. LOUIS
CLEVELAND
INDIANAPOLIS
DETROIT
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CHICAGO
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PHILADELPHIA
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CINCINNATI
NEW YORK
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WASHINGTON, D. C.
BOSTON
BIRMINGHAM
KANSAS CITY

"COAST-TO-COAST"

CLIPPER DIAMOND BLADES

• A complete selection of blade types for every sawing job... SAW asphalt or concrete floors, or SAW contraction joints in fresh poured slabs.

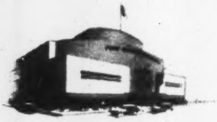
CLIPPER MANUFACTURING CO.
CONCRETE SAW DIVISION
2812 N. Warwick, KANSAS CITY 8, MO.
Send FREE Literature, Information and Prices on the NEW CLIPPER CONCRETE SAWS 8C

NAME __________
COMPANY __________
STREET __________
CITY __________ STATE __________

SOLD ONLY DIRECT FROM FACTORY

the PEELLE MOTORSTAIR

Port of New York Authority Bus Terminal, New York, N. Y.—Archts.—Port of New York Authority Engineers



In Transportation Terminals—

the Peelle Motorstair extends transportation to the inside of the building and moves vast crowds to waiting buses, trains and other conveyances with dispatch and without confusion.

Statler Center, Los Angeles, Calif.—Archts.—Holabird, Root & Burgee, Chicago, Ill.

In Hotels and Banks—

the Peelle Motorstair frees valuable ground floor property for high rental by making it easy and convenient for the public to reach business places located on upper levels.

This bank of five Peelle Motorstairs is an essential part of the great vertical transportation system in the New York Port Authority Bus Terminal. Thirty-one Peelle Motorstairs, a basic functional design feature of this outstanding building, move vast crowds every day of the year. Their performance proves that the advanced engineering of the Peelle Motorstair has greatly contributed to the smooth, trouble-free movement of passengers between floors. And so it is in a variety of prominent buildings all over the North American Continent where the Peelle Motorstair is establishing low maintenance records and assuring longer life as the result of simpler construction and the more even distribution of loading on all moving parts.

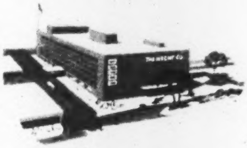
In the new, wider C-48 Peelle Motorstair, the same advanced concepts are incorporated and it delivers the same smooth, economical performance. This new model is 48 inches wide and each step allows ample room for two adults to stand side by side in comfort. It can move up to eight thousand persons per hour. The C-48 is now being installed in some of the most famous stores in the country. For more complete information and technical details on Peelle Motorstairs write for folder PM-505.

SEE OUR CATALOG IN SWEET'S

PEELLE MOTORSTAIRS

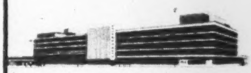
- inspires new concepts in building
- increases functional values
- releases street floors for high rent yields

Hecht Shopping Center, Arlington, Va.—Archts.—Abbott, Merkt & Company, New York, N. Y.



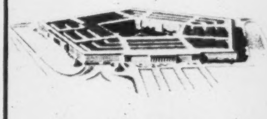
In Stores–
the Peelle Motorstair has proved to be a powerful merchandising force in many cities by "moving people to buy" on upper sales floors in comfort and without delay or crowding.

Abbott Laboratories, North Chicago, Ill.—Archts.—Naess & Murphy, Chicago, Ill.



In Industrial Plants–
the Peelle Motorstair promotes better labor relations, expedites the movement of employees from floor to floor and eliminates delay at hours when there is peak traffic.

Pentagon Building, Arlington, Va.—Archts.—U. S. Government—General Service Administration



In Many Other Buildings
The Peelle Motorstair helps theatres fill balconies, makes roof and sub-basement parking areas more convenient, moves crowds at stadiums and race tracks and performs many other valuable functions.

"it's **PEELLE** *engineered*"

BETTER ENGINEERED PRODUCTS FOR MORE THAN 45 YEARS

PEELLE MOTORSTAIR

THE PEELLE COMPANY
PEELLE MOTORSTAIR DIVISION
47 STEWART AVENUE, BROOKLYN 37, N. Y.
Offices in principal cities

FREIGHT ELEVATOR DOORS • DUMBWAITER DOORS • INDUSTRIAL DOORS

PARTIAL LIST OF PEELLE MOTORSTAIR INSTALLATIONS

DEPARTMENT STORES

McCRORY STORES, Lexington, Ky.
Archts.—Holabird, Root & Burgee, Chicago, Ill.
L. BAMBERGER & CO. (R. H. MACY), Princeton, N. J.
Archts.—Ketchum, Gina & Sharp, New York, N. Y.
EVERGREEN PARK SHOPPING CENTER, Evergreen Park, Chicago, Ill.
Archts.—Holabird, Root & Burgee, Chicago, Ill.
HUTZLER BROTHERS, Towson, Maryland
Archts.—James R. Edmunds Jr. and Ketchum, Gina & Sharp, New York, N. Y.
MERK DEPARTMENT STORE, Longview, Wash.
Archts.—John Graham Company, Seattle, Wash.
B. GERTZ, INC., Flushing, N. Y.
Archts.—Abbott, Merkt & Company, New York
WHITNEY STORE, San Diego, Calif.
Archt.—G. R. Saunders
C. R. ANTHONY COMPANY
Beaumont, Texas
Borger, Texas
McAllen, Texas
Midland, Texas
Temple, Texas
Norman, Oklahoma
Texarkana, Arkansas
Archt.—Fred H. Zahn, Oklahoma City, Okla.
J. C. PENNEY COMPANY
Louisville, Kentucky
Archts.—J. C. Penney Company, New York, N. Y.
Lansing, Michigan
Archts.—Gillette & Bell, New York, N. Y.
Lincoln, Nebraska
Archts.—Davis & Wilson, Lincoln, Neb.
Omaha, Nebraska
Archts.—J. C. Penney Company, New York, N. Y.
SEARS, ROEBUCK & COMPANY
Erie, Pennsylvania
Archts.—The Ballinger Co., Philadelphia, Pa.
Hamilton, Ohio
Archts.—Mueller, Hair & Hetterich, Hamilton, Ohio
GEORGE B. PECK, INC., Kansas City, Mo.
Archts.—Kivett & Myers, Kansas City, Mo.
McALLISTER-SCHOEN COMPANY, LaGrange, Ill.
Archts.—Abell-Howe Company, LaGrange, Ill.
HECHT COMPANY, Arlington, Va.
Archts.—Abbott, Merkt. & Company, New York
POMEROY'S, Reading, Pa.
Archts.—Muhlenberg, Yerkes & Muhlenberg, Reading, Pa.
YOUNKER'S OF IOWA, Iowa City, Iowa
Archts.—Younker's, Des Moines, Iowa
FISHER'S STORE, Tacoma, Wash.
Archt.—John Graham, Seattle, Wash.
MULLER COMPANY, LTD., Lake Charles, La.
Archts.—Bartlett Cocke, San Antonio, Texas
GATELY'S PEOPLES STORE, Chicago, Ill.
Archts.—Nordlee & Company, Chicago, Ill.
T. EATON COMPANY
Vancouver, B. C.
New Westminster, B. C.
Archts.—Dominion Construction Co., Vancouver
WM. LAUBACH & SONS, Easton, Pa.
Archts.—Thalheimer & Weitz, Philadelphia, Pa.
WALKER'S DEPT. STORE, Long Beach, Calif.
Archts.—Charles P. Morgan Associates, Long Beach, Calif.

CLUBS, THEATRES & HOTELS

HAROLD'S CLUB, Reno, Nevada
Archt.—Perry Means, Reno, Nevada
STATLER CENTER, Los Angeles, Calif.
Archts.—Holabird, Root & Burgee, Chicago, Ill.
CARIB THEATRE, Miami Beach, Florida
Archt.—Michael J. DeAngelis, Rochester, N. Y.
MAYFLOWER HOTEL CORP., Washington, D. C.
Archt.—Robert F. Beresford, Washington, D. C.
LOS ANGELES TURF CLUB, Arcadia, Calif.
Archt.—Robert E. Choate, Pasadena, Calif.

OFFICES

PENTAGON BUILDING, Arlington, Va.
Archts.—U. S. Government—General Service Administration
CAPITAL ANNEX BUILDING, Frankfort, Ky.
Archts.—Meriwether, Marye & Associates, Lexington, Ky.

TRANSPORTATION

PENNSYLVANIA RAILROAD, Journal Square, Jersey City, N. J.
Archt.—Morris L. Tapman, Jersey City, N. J.
HUDSON & MANHATTAN RAILROAD, Grove Street, Jersey City, N. J.
Archts.—Hudson & Manhattan R.R. Company (Station by Dreyfuss)
MUNICIPAL PARKING & BUS TERMINAL, Bridgeport, Conn.
Archt.—Harry G. Lindsay, Bridgeport, Conn.
TORONTO TRANSPORTATION COMMISSION, Toronto, Canada
Archts.—DeLeuw, Cather & Company, Chicago, Ill.
PORT OF NEW YORK AUTHORITY BUS TERMINAL, New York, N. Y.
Archts.—Port of New York Authority Engineers

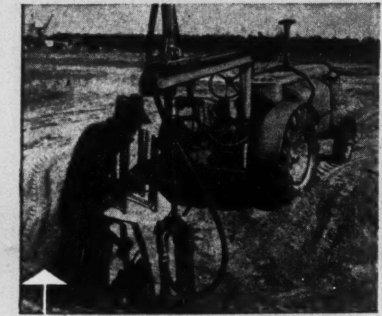
INDUSTRIAL

FORD MOTOR CO., Livonia, Mich.
Archts.—Albert Kahn Associated Architects & Engineers, Inc., Detroit, Mich.
ABBOTT LABORATORIES, North Chicago, Ill.
Archts.—Naess & Murphy, Chicago, Ill.

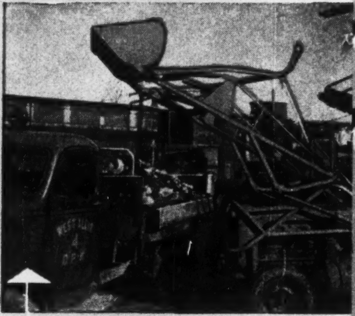
LE ROI TRACTAIR

LE ROI GIVES YOU MORE FOR YOUR MONEY

Mobildrill — A light-weight Le Roi-CLEVELAND wagon drill unit mounted on Tractair. Costs about half of what you would pay for separate compressors and rock drills to do same work. Its all-around usefulness makes drilling faster, easier. Quickly pays for itself out of savings.



Tamping — Tractair with Le Roi-CLEVELAND Multiple Tamper and work-saving air feed keeps up with three men shoveling or a backfilling tractor. You not only get faster, easier tamping, but also better compaction and lower costs.



Loading — Front-end loader can be attached to Tractair in only a few minutes. Boom combines bucket and crane. Crane folds back out of way, when not in use. Bucket holds 10½ cu. ft. — lifting capacity is 1000 lbs. Lifting capacity of crane is 800 lbs.

with Backhoe

cuts trenching costs for Illinois man . . . combines air power, digging power, and mobility, to do former two-day job in only half a day!

Your digging job too small for a power shovel? Too big to do by hand economically? Then, mister, you're money ahead with a Le Roi Tractair-Backhoe! It's a hydraulic backhoe attachment mounted on a Tractair, Le Roi's combination 35-hp tractor and 105-cfm compressor — you get both air power and digging power in a single piece of equipment.

Tractair-Backhoe units are saving money for contractors every day. Take John Proszek, plumbing contractor of Chicago, Illinois: He uses a Tractair-Backhoe to dig two ditches 60′ long x 6½′ deep for new home-service connections — and does in half a day what it took two days to do before!

The versatility of Tractair helps you do many jobs with greater speed and economy. Its *air power* lets you break through pavement or frost — run air tools. Its *digging power* lets you dig as deep as 7′ — cut through hard ground that a pick and shovel can't penetrate — keep the bottom of a ditch perfectly level — dig straight-end walls and square corners.

But that's only part of the Tractair story. There are other attachments you can use to multiply Tractair's usefulness and hold down your investment in special equipment. With Le Roi-CLEVELAND air tools, you can break pavement, drill rock, dig clay, tamp fill, etc. With a front-end loader (it has 8 accessories you can interchange quickly), you can load, lift, backfill, plow snow, etc.

Ask your nearby Le Roi distributor to demonstrate a Tractair. Write today for job-data sheets and bulletins on Tractair.

T-34

Compressors
Tractair
Rock Drills
Engines . . .

LE ROI COMPANY MILWAUKEE 14, WIS.
Plants: MILWAUKEE • CLEVELAND • GREENWICH, OHIO

Nation-Wide Sales-Service Network

ALABAMA: Birmingham, Mobile — ARIZONA: Phoenix — ARKANSAS: Little Rock — CALIFORNIA: Bakersfield, Long Beach, Los Angeles, San Francisco—COLORADO: Denver, Grand Junction — CONNECTICUT: Hartford — FLORIDA: Jacksonville, Miami, Tampa — GEORGIA: Augusta, Decatur—IDAHO: Boise, Idaho Falls, Twin Falls—ILLINOIS: Chicago—INDIANA: Indianapolis—IOWA: Cedar Rapids, Des Moines, Waterloo—KANSAS: Great Bend, Kansas City, Pratt, Wichita—KENTUCKY: Lexington, Louisville—LOUISIANA: New Orleans, Shreveport — MAINE: Augusta — MARYLAND: Baltimore, Hyattsville — MASSACHUSETTS: Hyde Park, Newton Highlands, Worcester—MICHIGAN: Detroit, Grand Rapids—MINNESOTA: Duluth, Minneapolis — MISSISSIPPI: Jackson — MISSOURI: Joplin, St. Louis — MONTANA: Billings, Great Falls, Kalispell, Missoula — NEBRASKA: Omaha — NEW HAMPSHIRE: Manchester — NEW JERSEY: Cranford, Kingston — NEW MEXICO: Albuquerque — NEW YORK: Albany, Binghamton, Buffalo, Long Island City, Newburgh, Rochester, Saugerties, Syracuse, Whitesboro, Woodside (L.I.) — NORTH CAROLINA: Charlotte — OHIO: Cincinnati, Cleveland, Columbus, Dayton, Toledo — OKLAHOMA: Oklahoma City, Tulsa — OREGON: Portland — PENNSYLVANIA: Bethlehem, Harrisburg, Philadelphia, Pittsburgh — RHODE ISLAND: Providence — SOUTH CAROLINA: Columbia — SOUTH DAKOTA: Rapid City, Sioux Falls — TENNESSEE: Chattanooga, Knoxville, Memphis, Nashville — TEXAS: Dallas, El Paso, Houston, Lubbock, San Antonio — UTAH: Salt Lake City — VIRGINIA: Richmond, Roanoke — WASHINGTON: Seattle, Spokane — WEST VIRGINIA: Clarksburg, South Charleston — WISCONSIN: Milwaukee — WYOMING: Casper

MORE UTILITY! MORE PROFIT!

Backfilling — A backfill blade adapts the versatile Tractair for such jobs as filling trenches, light grading, and other light dozing work — anywhere along the job site. Backfill blade is 6′ wide, moldboard is 2′8″ high. Maximum lift above ground is 1′4″.

Drilling, Breaking, Digging — Tractair puts air power to work running Le Roi-CLEVELAND air tools. Here, Tractair operates a clay digger, to speed up trenching. Tractair can be used also to run Le Roi-CLEVELAND breakers, sinker drills, backfill tampers.

Earth Drilling — Tractair with Utility Boom operates air motor-driven earth auger up to 16″ diameter — speeds up anchor-hole digging and other earth-drilling jobs. It's another way Tractair gives you extra hours of service by doing the work of specialized equipment.

For Dependable Concrete Forming...

USE SUPERIOR CONCRETE ACCESSORIES

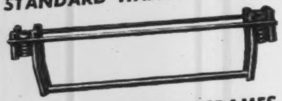
Here you see several of the many various types of Form Ties, Anchors and other concrete accessories which SUPERIOR'S many years of know-how and dependability have produced to meet rigid job specifications.

Every item in the SUPERIOR line is specifically designed to provide the most efficient forming method for ordinary foundations, engineering structures, watertight walls and architectural concrete.

When you plan form work, Superior's experienced engineers are always available to prepare suggested layouts of form work as well as complete estimates and quotations.

SNAP TIES

STANDARD HANGER FRAMES

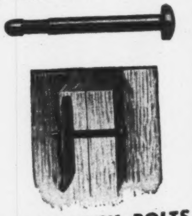


SPECIAL HANGER FRAMES

STANDARD COIL TIES

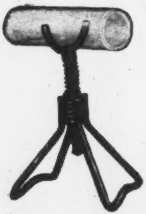
CONE-FAST COIL TIES

ROD CLAMPS

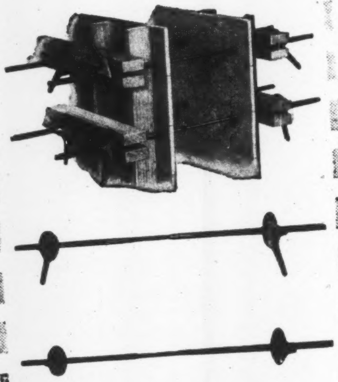


PANEL LOCK BOLTS

DOVETAIL ANCHORS AND SLOT



ADJUSTABLE SCREED CHAIRS



TILT LOCK CLAMPS

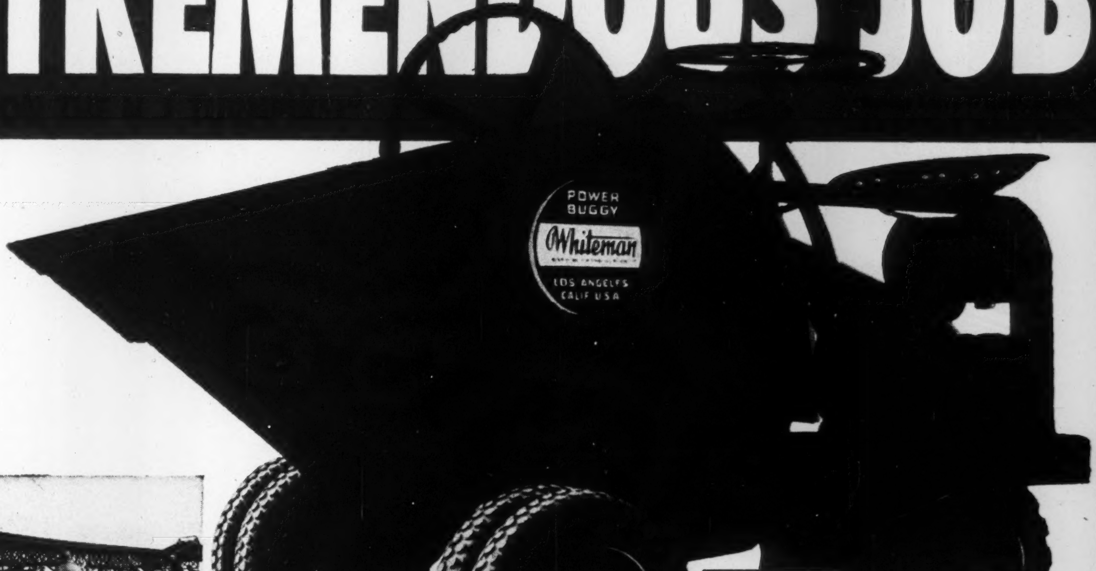
SUPERIOR CONCRETE ACCESSORIES, INC.

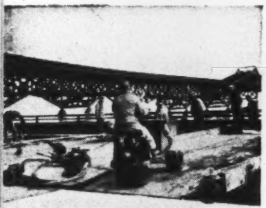
4110 Wrightwood Avenue, Chicago 39, Illinois
New York Office: 1775 Broadway, New York 19, N. Y.
Pacific Coast Plant: 2100 Williams St., San Leandro, Calif.

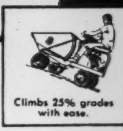
Request a copy of our new catalog... it contains a valuable table for spacing studs, wales, and form ties.

Whiteman [illegible]

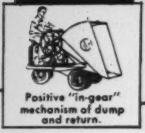
TREMENDOUS JOB



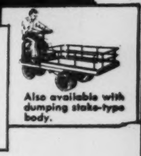




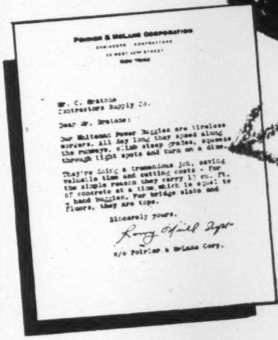
Climbs 25% grades with ease.



Positive "in-gear" mechanism of dump and return.



Also available with dumping stake-type body.



POIRIER & McLANE CORPORATION

NEW YORK

Mr. C. Bratone
Contractors Supply Co.

Dear Mr. Bratone:

Our Whiteman Power Buggies are tireless workers. All day long they speed along the runways, climb steep grades, squeeze through tight spots and turn on a dime.

They're doing a tremendous job, saving valuable time and cutting costs - for the simple reason they carry 13 cu. ft. of concrete at a time,which is equal to 4 hand buggies. For bridge slabs and floors, they are tops.

Sincerely yours,

Larry O'Neill Supt.

c/o Poirier & McLane Corp.

"Our Whiteman Power Buggies are tireless workers. All day long they speed along the runways, climb steep grades, squeeze through tight spots and turn on a dime. They're doing a tremendous job, saving valuable time and cutting costs—for the simple reason they carry 13 cu. ft. of concrete at a time,which is equal to 4 hand buggies. For bridge slabs and floors, they are tops."

Larry O'Neill, Supt.
c/o Poirier & McLane Corp.

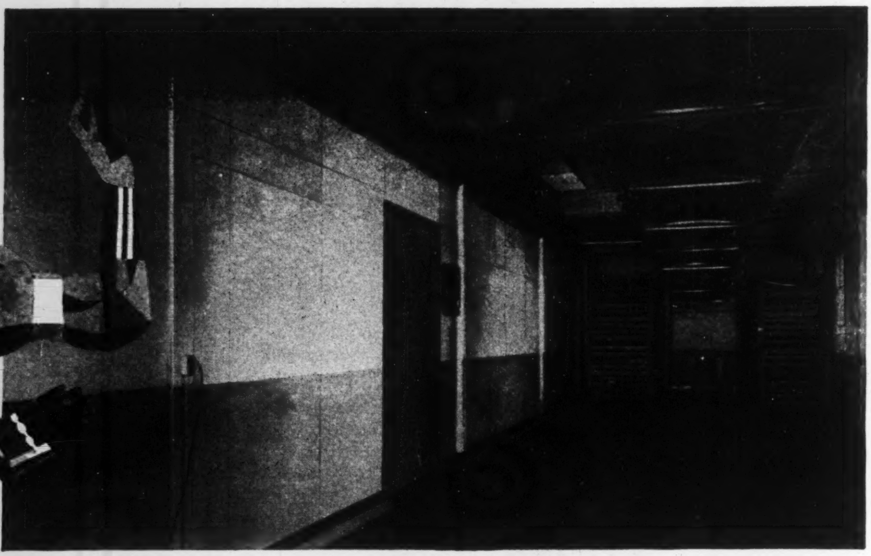
Whiteman

THE LEADER IN CONCRETE EQUIPMENT

WHITEMAN MFG. CO., Dept. F
3249 Casitas Ave., Los Angeles 39, Calif.

Please send prices, literature and name of distributor for___Power Buggy___Screeding Machines___Floating Finishing Machines.

Name____________________________
Firm____________________________
Address__________________________
City____________Zone____State________



In the critical Cigar Conditioning Room of D. W. G. Cigar Corporation, Lima, O. (home of such famous cigars as R. G. DUN, EL VERSO, and SAN FELICE), walls are ¼" "Century" APAC. This asbestos-cement structural board is also used in the Cigar Machine Room and Tobacco Conditioning Tunnel.

"These walls of 'Century' APAC are an added safeguard where temperature and humidity must be accurately controlled,"

says J. P. Weller, Master Mechanic—

No nurse in an infants' ward ever guarded her charges more jealously than D. W. G. Cigar Corporation watches over the thousands of quality cigars they turn out every day.

So when J. P. Weller, D. W. G.'s Master Mechanic, chooses "Century" APAC for the walls of the important Cigar Conditioning Room, you can take his word that APAC is an ideal material where temperature and humidity are accurately controlled.

And because APAC is made of mineral asbestos and portland cement, you know fire can't burn it . . . water can't soak it and termites can't eat it.

You'll find this asbestos-cement structural board gives you as low a first cost and maintenance expense (*never* needs painting!) as any comparable material you can use for interior or exterior walls . . . ceilings . . . partitions . . . and linings.

It goes on fast, too—big sheets (standard 4′ x 8′) can be cut or drilled and fastened easily with screws or ring-fettered nails. Write us for details about "Century" APAC . . . and name of your nearest distributor.

Nature made Asbestos . . .
Keasbey & Mattison has made it serve mankind since 1873.

K&M best in asbestos ®

KEASBEY & MATTISON

COMPANY • AMBLER • PENNSYLVANIA

PIN-POINT POSITIONING WAS EASY...

with their LIMA 34 TRUCK CRANE

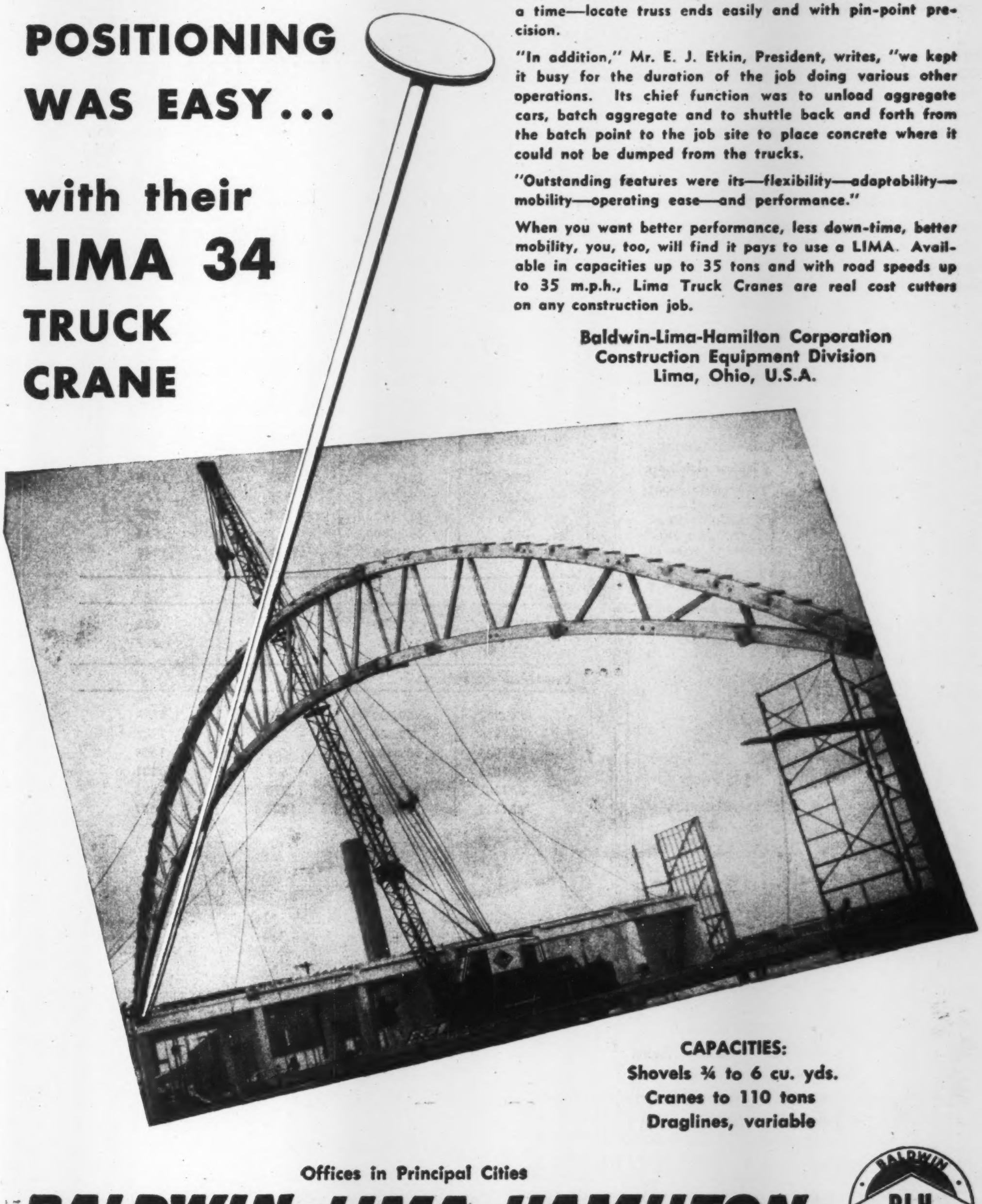
Thanks to their Lima Crane the E. J. Etkin Construction Company was able to position these awkward 165-foot trusses with ease on the Oscade AFB Project. With the smooth, accurate operation of the Lima swing clutches, they were able to swing the beam a fractional degree at a time—locate truss ends easily and with pin-point precision.

"In addition," Mr. E. J. Etkin, President, writes, "we kept it busy for the duration of the job doing various other operations. Its chief function was to unload aggregate cars, batch aggregate and to shuttle back and forth from the batch point to the job site to place concrete where it could not be dumped from the trucks.

"Outstanding features were its—flexibility—adaptability—mobility—operating ease—and performance."

When you want better performance, less down-time, better mobility, you, too, will find it pays to use a LIMA. Available in capacities up to 35 tons and with road speeds up to 35 m.p.h., Lima Truck Cranes are real cost cutters on any construction job.

Baldwin-Lima-Hamilton Corporation
Construction Equipment Division
Lima, Ohio, U.S.A.



CAPACITIES:
Shovels ¾ to 6 cu. yds.
Cranes to 110 tons
Draglines, variable

Offices in Principal Cities

BALDWIN-LIMA-HAMILTON

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS • TRUCK CRANES

FOR CLASSY SHOPS

. . . OR BUSY PLANTS

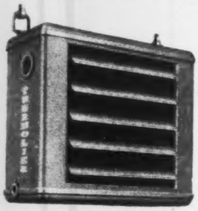
THERMOLIER UNIT HEATERS

The condensed table below is a quick guide to the selection of the correct Thermolier for specific conditions. The capacities, when motors are operating at normal speeds, are based on Standard Basis of Rating: 2 lb. steam pressure and 60° F entering air temperature.

Grinnell Thermoliers are tested and they are rated in strict accordance with rules of the Industrial Unit Heaters Association.

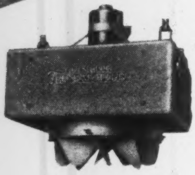
All Thermoliers can be operated at working steam pressures up to 125 psi and steam temp. up to 406° F.

A MODEL AND SIZE FOR EVERY PURPOSE



horizontal delivery

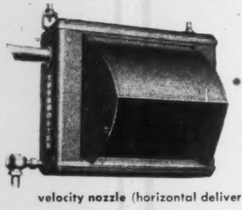
textile (horizontal delivery)



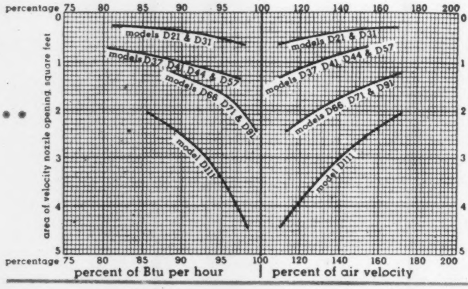
vertical delivery

model	total heat delivered, Btu per hr	sq ft edr (nominal)	air velocity at exit, louvers open, lin. ft. per min.
horizontal delivery			
D21	35,600	148	786
D31	48,700	203	851
D37	62,200	259	753
D41	71,000	295	901
D44	84,100	350	887
D57	101,300	422	1016
D66	128,700	536	779
D71	151,700	632	977
D91	196,000	817	985
D111	275,300	1147	1048
Textile			
TX70	69,800	291	826
TX110	113,700	474	877
vertical delivery			
VA1042	50,800	212	1399
VA1045	73,600	307	1287
VA1065	109,400	456	1354
VA1075	145,600	607	1231
VA1101	185,000	770	1495
VA1111	257,000	1071	1631

performance with velocity nozzle ▶



velocity nozzle (horizontal delivery)



GRINNELL

THERMOLIER UNIT HEATERS

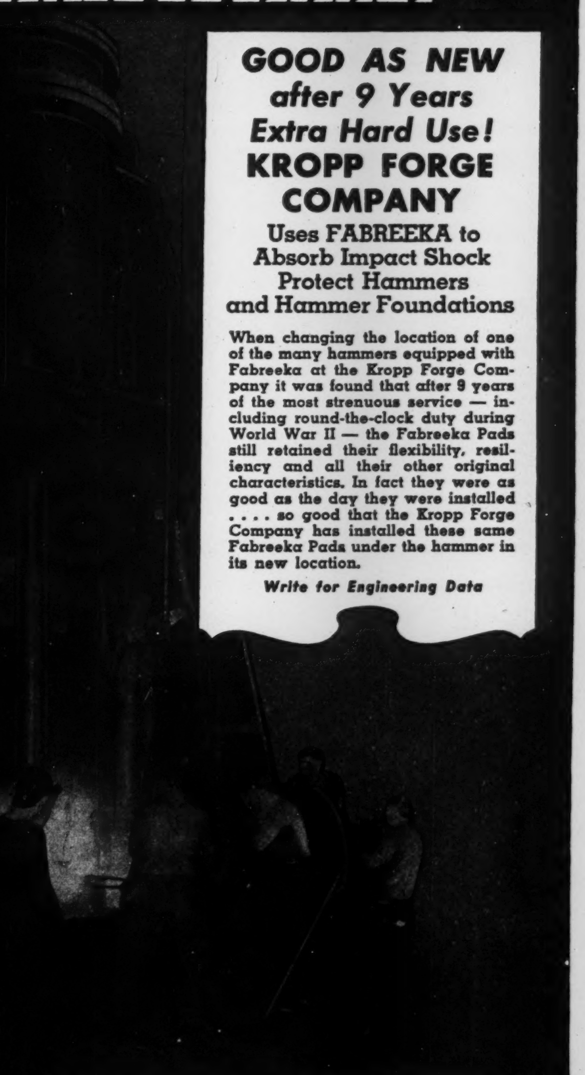
CALL YOUR LOCAL GRINNELL DISTRIBUTOR

Grinnell Company, Inc., Providence, Rhode Island

Coast-to-Coast Network of Branch Warehouses and Distributors

Manufacturer of: pipe fittings • welding fittings • forged steel flanges • steel nipples • engineered pipe hangers and supports
Thermolier unit heaters • Grinnell-Saunders diaphragm valves • prefabricated piping • Grinnell automatic fire protection systems

FABREEKA



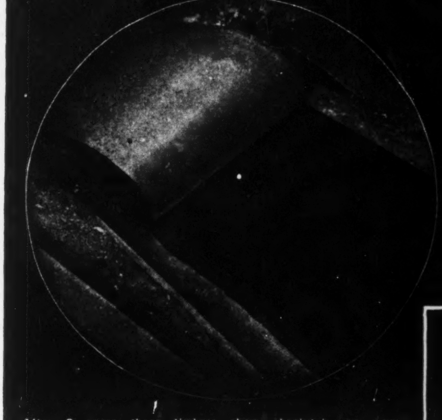
This 20,000 lb. Hammer
is one of many
Mounted on Fabreeka
at the
KROPP FORGE
COMPANY
CHICAGO, ILLINOIS

GOOD AS NEW after 9 Years Extra Hard Use! KROPP FORGE COMPANY

Uses FABREEKA to Absorb Impact Shock Protect Hammers and Hammer Foundations

When changing the location of one of the many hammers equipped with Fabreeka at the Kropp Forge Company it was found that after 9 years of the most strenuous service — including round-the-clock duty during World War II — the Fabreeka Pads still retained their flexibility, resiliency and all their other original characteristics. In fact they were as good as the day they were installed . . . . so good that the Kropp Forge Company has installed these same Fabreeka Pads under the hammer in its new location.

Write for Engineering Data

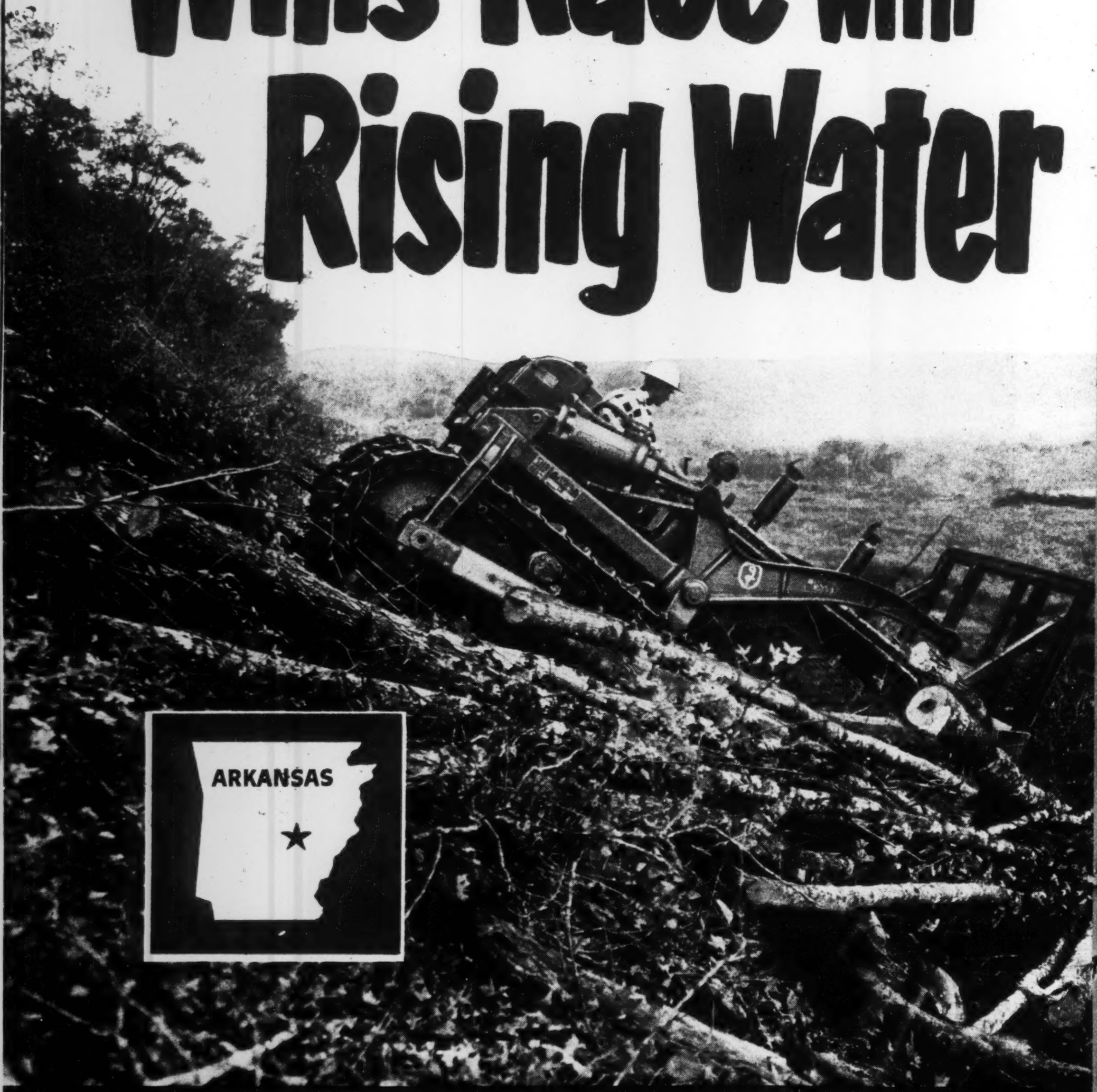


After 9 years these timbers show absolutely no wear. Fabreeka absorbs impact shock and protects the foundation of the hammer as well.

It Pays To Specify Fabreeka

FABREEKA PRODUCTS COMPANY
INCORPORATED
222-A SUMMER STREET, BOSTON 10, MASSACHUSETTS
NEW YORK CHICAGO DETROIT SPARTANBURG
PHILADELPHIA PITTSBURGH OAKLAND

Wins Race with Rising Water



Team of IH crawlers clears reservoir in the mountains while White River backs up behind Bull Shoals Dam

The minute they closed the new Bull Shoals Dam on Arkansas' White River, water started backing up over ground still covered with trees and brush. It had to be cleared and cleared fast, and one of the crews on the big job was Patton Construction Co.

Patton tackled the steep, overgrown slopes with 150 men and six International crawlers ranging from TD-18A's down to a TD-9. Each crawler averaged 10 acres cleared a day—*"remarkable, in this rough Ozark Mountain country,"* says Tractor Foreman Hallie Goldsmitt.

And operator W. W. Sloane, adds, *"We go up these mountainsides forwards, backwards or sideways—but we go up somehow and we get the job done because these Internationals have the power."*

Ask your International Industrial Distributor today for details on the whole International line of rugged red crawlers. Ask about his service, too—and his complete stock of spare parts for any emergency. Get all the answers—and put International "Power that Pays" to work for you!

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

SEE YOU AT THE POLLS!

INTERNATIONAL HARVESTER

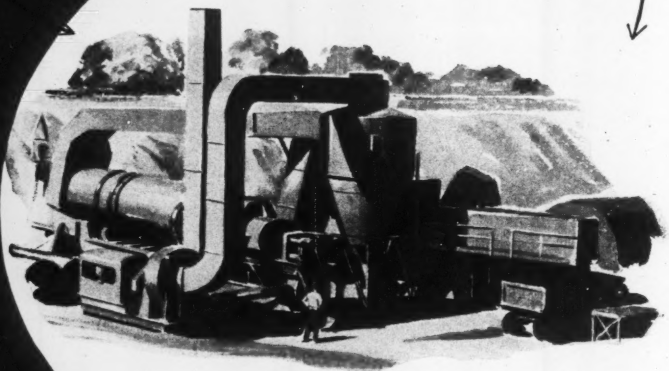
INTERNATIONAL

POWER THAT PAYS

DOWN the hill goes a TD-18A, and down go the trees that stand in its way. International crawlers have what it takes, both in sheer dogged power and rugged reliability.

UP comes another TD-18A, hitting fast and hard on a job where speed counts in beating the rising waters backing up behind the dam to create a new reservoir.

Protection by TOUSEY!



TOUSEY Duracote protects this [illegible] complicated asphalt plant [illegible] against weather, corrosion, liquids [illegible] dirt and abrasion in operation [illegible] [illegible] the paint that [illegible] washed up, painted over, or [illegible] and one with a strong, durable surface. [illegible] the quality and uniformity [illegible] another form of protection TOUSEY offers [illegible] a protection of 57 years standing.

TOUSEY PRODUCTS

DURACOTE for DURABILITY

THE TOUSEY VARNISH COMPANY

in sound conditioning
... call in this expert
and say good-bye to doubts and worry!

The instant you let a Sound Conditioning sub-contract to your local distributor of Acousti-Celotex products, you can rest assured. Assured the job is in the best hands! Assured, in advance, of the most effective, most attractive installation possible!

You're carefree and work-free, too. For your distributor of Acousti-Celotex products shoulders personal responsibility for every detail. No headaches for you. No tampering with specifications. No fear of a messed-up job.

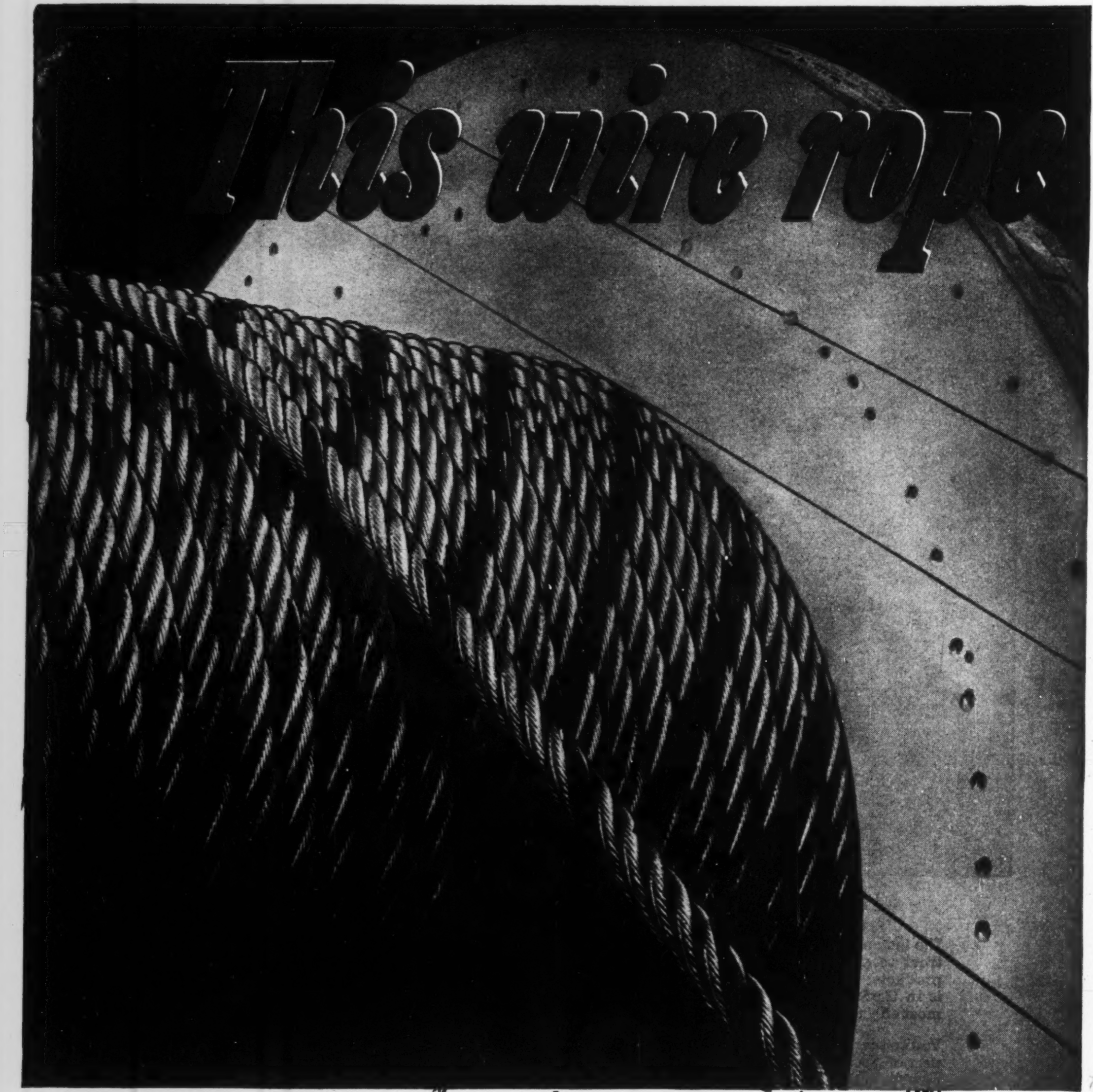
You can count on your local distributor of Acousti-Celotex products every time. He's a member of the world's most experienced Sound Conditioning organization, with more installations to its credit than any other. He has the trained, experienced men—the job-proved techniques—the complete line of superior, specialized acoustical products to meet every specification, requirement, building code.

GET A FREE ANALYSIS of the noise problem in any buildings you are planning without obligation. Write now for the name of your local distributor of Acousti-Celotex products. You will also receive free an informative booklet, "25 Answers to Questions on Sound Conditioning." The Celotex Corporation, Dept. Z-92, 120 S. La Salle St., Chicago 3, Ill. In Canada, Dominion Sound Equipments, Ltd., Montreal, Quebec.

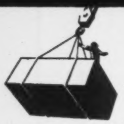
Sound Conditioning is a Sound Investment...

ACOUSTI-CELOTEX
TRADEMARK REGISTERED U. S. PAT. OFF.
Sound Conditioning

PRODUCTS FOR EVERY SOUND CONDITIONING PROBLEM
THE CELOTEX CORPORATION, 120 S. LA SALLE ST., CHICAGO 3, ILLINOIS


This wire rope

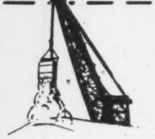
CONSTRUCTION


LIFTING

MINING

MANUFACTURING

LOGGING


QUARRYING

OIL & GAS

TRANSPORTATION

must deliver...

because "We always strive to make HERCULES *Red-Strand* Wire Rope *better than we claim it to be...*"

This is a primary principle of Leschen manufacture. It *must* give you Red-Strand wire rope that wears exceptionally long . . . delivers top tonnage. It *must* give you Red-Strand wire rope that saves workers' time . . . earns their complete trust.

You get manufacturing craftsmanship when you use Hercules* Red-Strand wire rope. Leschen management and workmen know wire rope inside and out—*it's their only business.* They know how to make it better. Generations of the Leschen family—and workmen's families—take pride in producing a product that will serve you better.

You get exactingly tested wire rope when you use Hercules Red-Strand. Every coil of wire that goes into Leschen rope is rigidly torsion- and tension-tested. Every rope is double-checked for accurate fabrication—diameter, length of lay, strand clearance, lubrication. During World War II, millions of feet of Leschen wire rope passed every test by the Armed Forces *without a single reject.*

You get individual attention to satisfy your exact needs. Every executive, representative and workman in the Leschen organization follows this 95-year-old policy. Records are kept on every length of wire rope made in the Leschen mill—to provide rechecks on every installation—and to help you get the best type and grade of wire rope for your specific application.

Try Hercules Red-Strand wire rope. *Keep comparative records.* You'll *experience the difference.* Next time, specify . . .

PREFORMED • ROUND STRAND • FLATTENED STRAND • NON-ROTATING • LOCKED COIL • SLINGS

LESCHEN WIRE ROPE

*Reg. U.S. Pat. Off.

A. Leschen & Sons Rope Co., St. Louis 12, Missouri

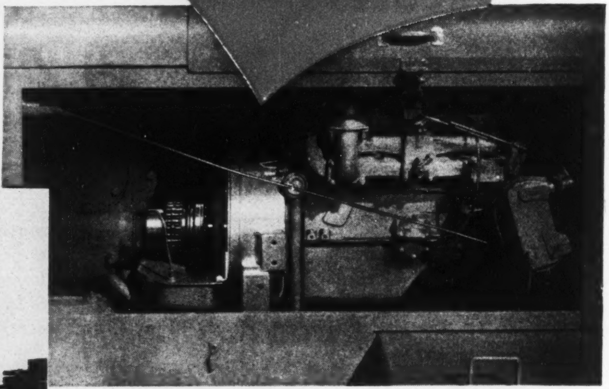
In business only to make wire rope—better wire rope—since 1857

DISTRIBUTORS IN ALL PRINCIPAL CITIES

Announcing UNIT with FLUID TORQUE DRIVE

To a long line of improvements in design and construction, UNIT has added another advancement — FLUID TORQUE DRIVE. This torque converter application gives the operator a steady flow of power which he can regulate with smoothness and accuracy. Elimination of shock loads adds life to bearings, shafts, gears, and cables . . . brings maintenance costs down to a minimum. Excavating work is done with a strong steady flow of power, with no "stall" and no "delay" while the engine regains speed. Crane work can be done with greater smoothness of operation by throttle control.

UNIT offers the Chrysler Torque Converter as a standard installation at no extra cost on ½ yard machines equipped with 6 cylinder Chrysler Industrial Gasoline Engines.



UNIT 357 MOBILE CRANE

SM-O-O-THER PERFORMANCE — Smoothness of operation is achieved in traveling as well as in lifting and digging. The Torque Converter in Mobile equipment allows for smooth break-away performance.

UNIT 614 SHOVEL

Time-saving, Cost-reducing Advantages

- Greater work output without increasing fuel consumption
- Eliminates "shock loads" on machinery, reducing maintenance cost
- Smoother and more accurate control of all operations
- Builds up line pull without excessive load on engine
- Full steady power for peak loads without stalling engine
- Quick engine pickup retains maximum line speeds
- Provides "regulated load handling" by throttle control
- Increases lugging power for hard excavating
- Engine clutch eliminated entirely
- Installation available at NO EXTRA COST

UNIT CRANE & SHOVEL CORP.
6315 W. Burnham St., Milwaukee 14, Wis., U.S.A.

Other UNIT machines are available in ½ and ¾ yard Excavators and Cranes up to 20 Tons . . . Crawler or Mobile Types . . . Gas or Diesel . . . Fully convertible to ALL attachments. Write for descriptive literature.

SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHOES • MAGNETS

A 7199-1PC

QUICK HEAT

ON THE JOB . . .

. . at the flick of a switch!

Features . . .

SAFE . . .

completely automatic . . . controls anticipate any emergency.

CLEAN . . .

burns clean with no soot or fumes . . . no carbon monoxide or unburned hydrocarbons.

LOW COST . . .

low original cost — low operating cost — uses No. 2 fuel oil.

EASY TO USE . . .

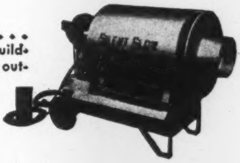
just flick the switch for instant heat, instant shut-off. No matches or open torches for lighting.

When you need heat on the job next winter, wheel the Model RF where you want it . . . *and flick the switch*. In five minutes you'll have all the heat you need to dry plaster, keep concrete from freezing, insure comfortable working conditions. SAFE . . . completely automatic, controls anticipate any emergency. CLEAN . . . burns without smoke, soot or fumes . . . no carbon monoxide or unburned hydrocarbons. LOW COST . . . low original cost . . . low operating cost . . . uses No. 2 fuel oil. Unit delivers 168,000 BTU per hour.

Don't wait until winter weather causes construction delay . . . get the facts about Silent Glow portable heaters now.

MODEL A

Portable forced air heater . . . ideal for space heating in buildings under construction. Heat output, 189,000 BTU per hr.



SILENT GLOW

MODEL B

Portable forced air heater . . . same construction as Model A, except larger. Heat output, 350,000 BTU per hr.

SILENT GLOW

HEATERS

PORTABLE

Get the facts Today!

TO: THE SILENT GLOW OIL BURNER CORP.
853 Windsor St., Hartford 5, Conn.

Send us the complete facts about Silent Glow Portable Heaters.

Name ____________________

Company ____________________

Street ____________________

City __________ State __________

Next!

Listen to men who own Internationals and we think you'll be the next to own one.

An International is engineered to breeze through your toughest jobs, at less cost, in greater comfort. It's engineered to last longer and make you more money.

So see your International Truck Dealer or Branch. You'll quickly learn why performance and economy make Internationals the pride of owners everywhere. Come in. *Soon?*

INTERNATIONAL HARVESTER COMPANY · CHICAGO

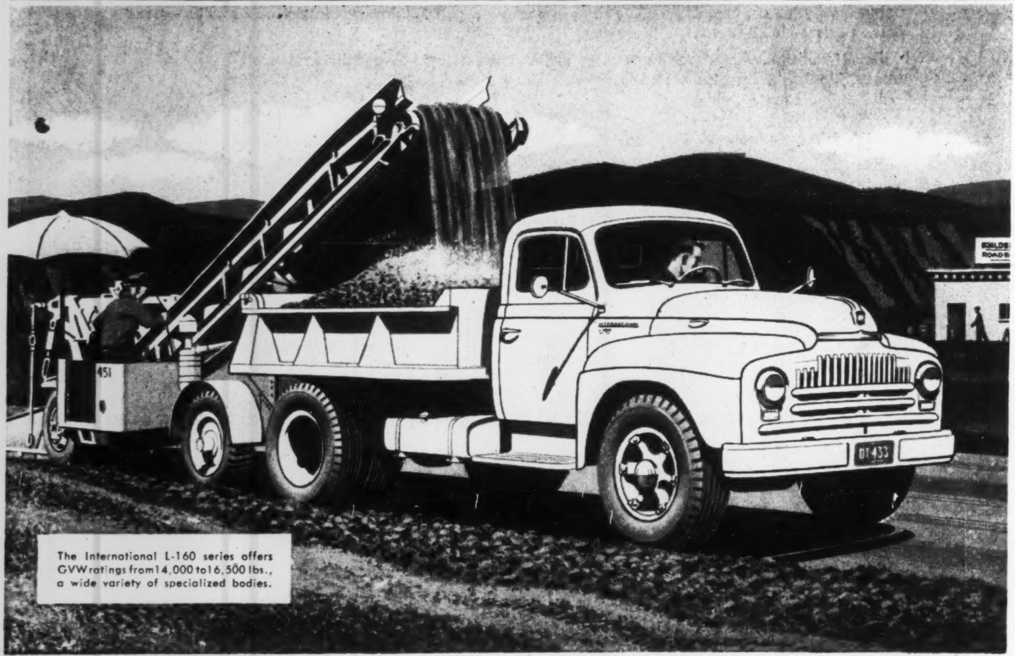
Why settle for less than these International exclusives?

- All-truck engines—exclusively for truck work—built in the world's largest exclusive truck engine plant.
- The "roomiest, most comfortable cab on the road"—the Comfo-Vision Cab designed by drivers for drivers.
- Super-steering system—more positive control, easier handling, 37° turning angle for maximum maneuverability.
- The traditional truck toughness that has kept International first in heavy-duty truck sales for 20 straight years.
- The truck engineered for your job, selected from the world's most complete line . . . 115 basic models, from ½-ton pickups to 90,000 lbs. GVW ratings.
- America's largest exclusive truck service organization.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

INTERNATIONAL TRUCKS

"Standard of the Highway"



The International L-160 series offers GVW ratings from 14,000 to 16,500 lbs., a wide variety of specialized bodies.

RUST-OLEUM
STOPS RUST!
RUST-OLEUM
RUST PREVENTIVE
STOPS RUST!
769 DAMP-PROOF RED

STOP RUST! with RUST-OLEUM

Protects Tanks,
Pipes, Girders,
Metal Sash,
Fences, Roofs
and Buildings,
Rail and Marine
Facilities

BEAUTIFY AS YOU PROTECT—ALL COLORS, ALUMINUM AND WHITE!

RUST-OLEUM may be applied directly over *rusted surfaces without removing all the rust!* Just remove rust scale and loose particles with wire brush and sharp scrapers . . . then apply by brush, dip, or spray. Costly sandblasting and chemical pre-cleaning are not usually required. Easy as that to cut your maintenance costs. Specify **RUST-OLEUM** to your painting contractor or architect for *every rustable* metal surface! Prompt delivery from Industrial Distributor stocks in principal cities.

RUST-OLEUM CORPORATION
2694 Oakton Street • Evanston, Illinois

FREE SURVEY: A **RUST-OLEUM** specialist will gladly survey your rust problems. He'll make specific tests and recommendations. No cost or obligation. See Sweets for complete catalog and nearest **RUST-OLEUM** distributor, or write for literature on your company letterhead.

Stopping Rust with
RUST-OLEUM
769 D. P. Red Primer

CLIP THIS TO YOUR LETTERHEAD
MAIL TO: RUST-OLEUM CORPORATION
2694 Oakton Street • Evanston, Illinois

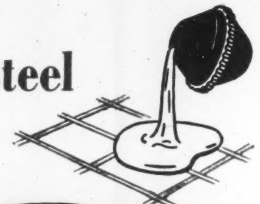
☐ Have a Qualified Representative Call
☐ Full Details on Free Survey
☐ Complete Literature
☐ Nearest RUST-OLEUM Source

Look for this label — be sure it's genuine RUST-OLEUM

The ACI Code proves it . . .

You don't have to buy so much steel

when you use American Welded Wire Fabric



● Read the American Concrete Institute Code and it will show you how to save steel by specifying American Welded Wire Fabric.

Example:

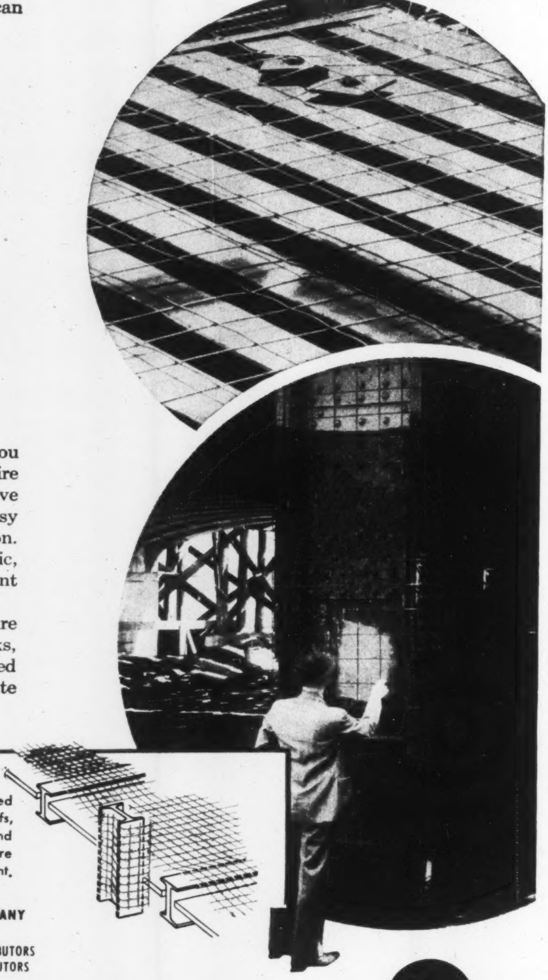
American Welded Wire Fabric is allowed a working stress of 28,000 psi for short span floor construction. That's 40% saving of steel over other types of reinforcing materials. Because the fabric is prefabricated, less labor is required—there is less steel to handle—it takes less time to place—there is less material to transport.

Example:

The specifications for reinforced concrete walls call for minimum ratios of steel area to wall area. If you use American Welded Wire Fabric, you can use 28% less steel area than with other reinforcing materials. You don't have to buy so much steel to get the strength you need.

These figures are impressive. They mean that you save critical steel when you use American Welded Wire Fabric. But just as important is the fact that you save critical labor. American Welded Wire Fabric is so easy to install that you just can't make a real comparison. Take slab construction: You simply unroll the fabric, lap the joints and you're done. No other reinforcement material can be installed so quickly.

Standard sizes of American Welded Wire Fabric are now readily available from jobbers' and dealers' stocks, supplemented by prompt mill shipments to identified projects. Present CMP Regulations assure adequate warehouse stocks of Fabric.



This sketch shows where American Welded Wire Fabric is used in modern concrete buildings. It reinforces walls, floors and roofs, can be draped over beams and girders and wrapped around pillars. Many uses of concrete in irregular structural shapes are made practical by American Welded Wire Fabric reinforcement.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL COMPANY
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

Every type of concrete construction needs

U·S·S AMERICAN WELDED WIRE FABRIC
reinforcement

UNITED STATES STEEL

Take down that sign...

HELP WANTED
DRAFTSMAN

when you copy drawings, plans, sketches with
NEW VACUUM SEAL PORTAGRAPH

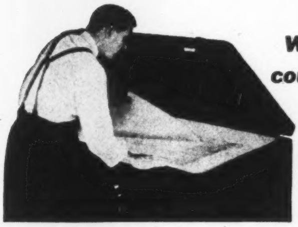
Beat the shortage of trained draftsmen by installing Remington Rand's new Vacuum Seal Portagraph.

With Portagraph, *anyone* on your office staff can copy drawings or blueprints...make black and white working copies...revise details without retracing entire drawings...restore old drawings and protect new ones...copy vendors' reports, specifications, statements, correspondence. And these jobs can be done in a *matter of minutes.*

Portagraph gives you a sharp, high contrast negative which can be used to make either permanent working copies on opaque stock or ink-like tracings on transparent stock. Portagraph tracings are more permanent than ink copies, do not smudge, will withstand many erasures.

You are assured of clean, clear copies every time on drawings up to 42" x 60". That's because these model Portagraphs (G212 and G213) employ the industry-acknowledged vacuum seal principle to give positive contact between the item to be copied and the photographic paper.

Portagraph is also available in smaller sizes.



Where every minute counts...you can save days copying with PORTAGRAPH

FREE BOOKLET EXPLAINS LABOR-SAVING PORTAGRAPH. SEND FOR IT TODAY.

Remington Rand INC

Room 1338, 315 Fourth Ave., New York 10

I'd like to see how Portagraph can help me beat the shortage of trained draftsmen. Please send me a free copy of P-305.

Name____________ Title________
Company____________
Street Address____________
City________ Zone____ State______

"HOT" ON THE TRAIL OF WEAR
DELVAC OILS
THE FLYING RED HORSE COMPANIES:

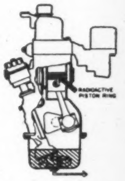
New Radio-Active Tracer Tests Prove Delvac Oils' New Super-Detergent Formula Cuts Engine Wear—Lowers Oil Consumption

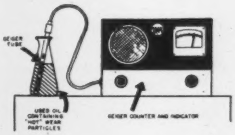
From tests with radio-active tracers taken from the atomic pile at Oak Ridge comes the proof:

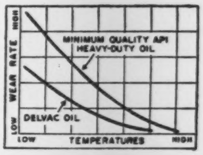
Delvac Oils with new super-detergent formula sharply reduce wear during low-temperature operation *when most wear occurs* . . . during starts and warm-ups and stop-go operation. Less engine wear means longer engine life, fewer overhauls — lower fuel and oil consumption, too!

For additional protection, Delvac Oils also provide other outstanding performance qualities. They resist oxidation and foaming, guard against corrosion, minimize formation of varnish, lacquer, sludge. They help your engines develop full power — help keep maintenance costs at rock bottom!

Call your Socony-Vacuum representative today for these improved, super-detergent Delvac Oils. They are recommended or approved by 125 of the country's leading engine and equipment builders.



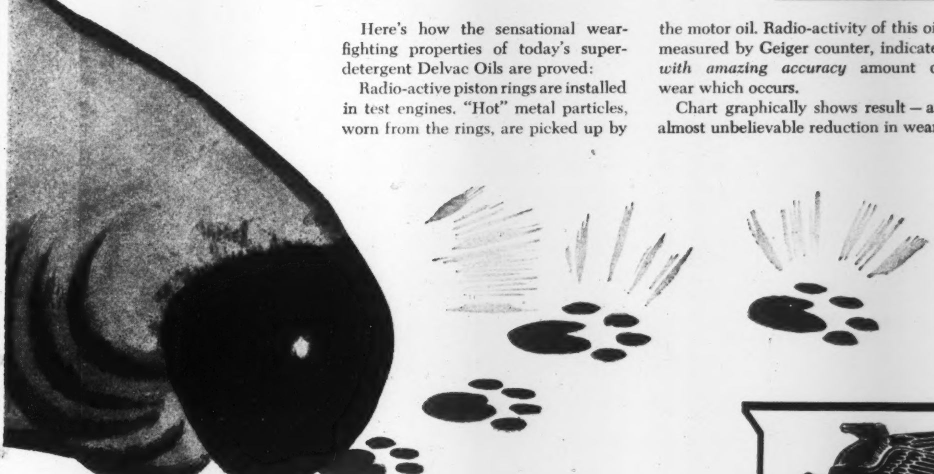

GEIGER TUBE
USED OIL CONTAINING "HOT" WEAR PARTICLES
GEIGER COUNTER AND INDICATOR



Here's how the sensational wear-fighting properties of today's super-detergent Delvac Oils are proved:

Radio-active piston rings are installed in test engines. "Hot" metal particles, worn from the rings, are picked up by the motor oil. Radio-activity of this oil, measured by Geiger counter, indicates *with amazing accuracy* amount of wear which occurs.

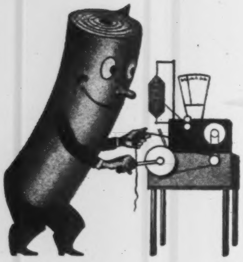
Chart graphically shows result — an almost unbelievable reduction in wear!



SOCONY-VACUUM

Correct Lubrication for Contractors

SOCONY-VACUUM OIL CO., INC., MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.

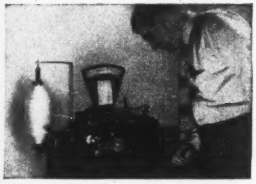


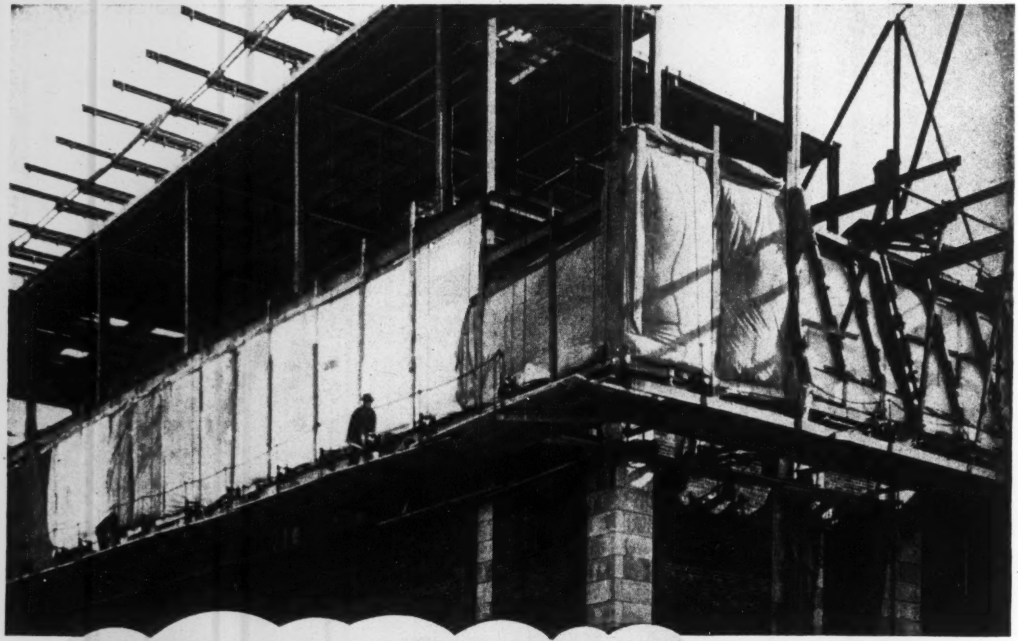
UNIFORMITY
Makes the Big Difference
In TARPAULINS

MT. VERNON EXTRA

Gives You Greater Fabric Uniformity

Checking evenness of roving with Belger Tester. One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products.

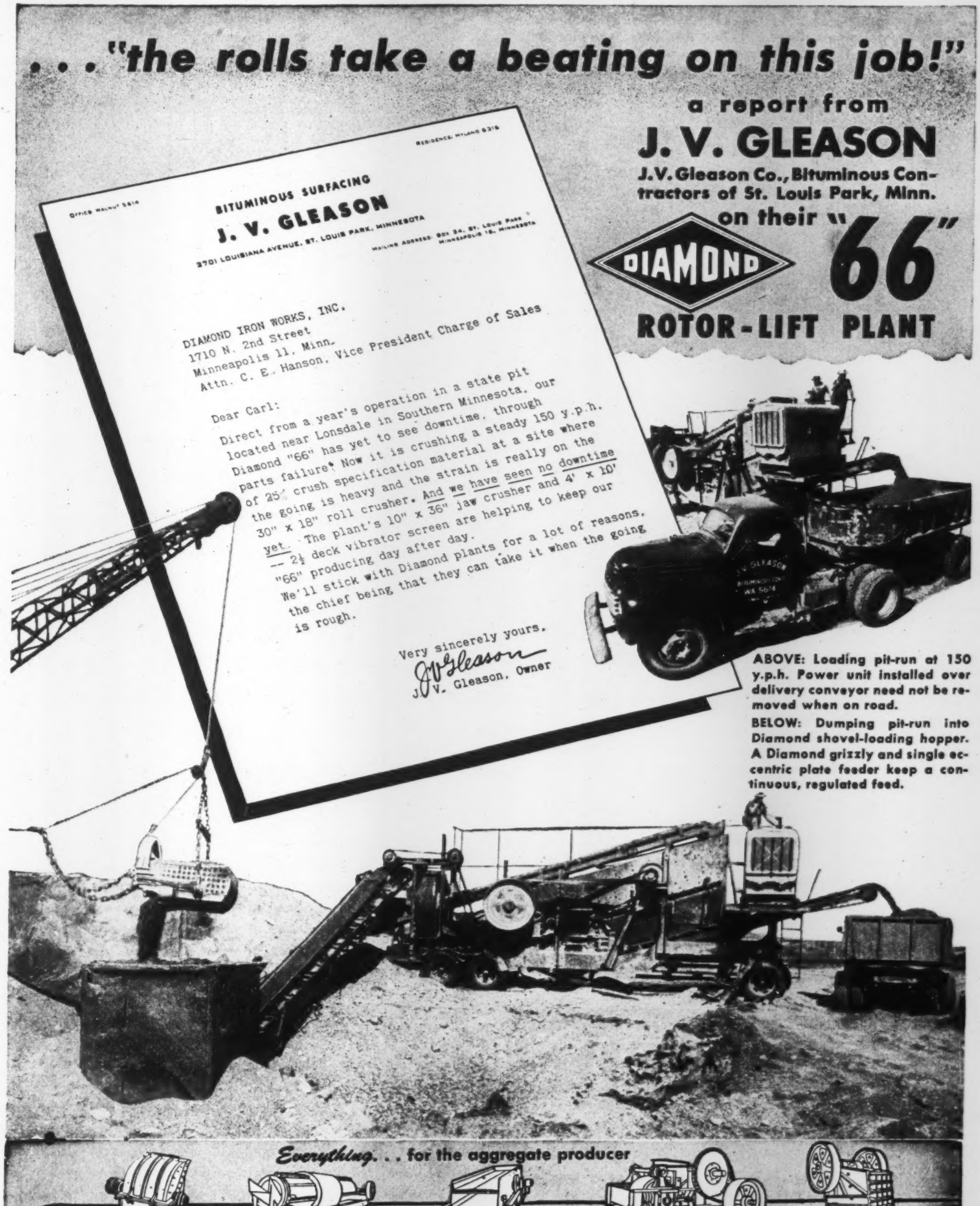




Mt. Vernon-Woodberry Mills

Branch Offices: Chicago • Atlanta • Baltimore • Boston • Los Angeles

TURNER HALSEY
COMPANY
Selling TH *Agents*
40 WORTH ST. NEW YORK



. . . "the rolls take a beating on this job!"

a report from

J. V. GLEASON

J.V. Gleason Co., Bituminous Contractors of St. Louis Park, Minn.

on their DIAMOND "66"

ROTOR-LIFT PLANT

OFFICE WALNUT 5614

BITUMINOUS SURFACING

J. V. GLEASON

2701 LOUISIANA AVENUE, ST. LOUIS PARK, MINNESOTA

RESIDENCE HYLAND 6316

MAILING ADDRESS: BOX 34, ST. LOUIS PARK
MINNEAPOLIS 16, MINNESOTA

DIAMOND IRON WORKS, INC.
1710 N. 2nd Street
Minneapolis 11, Minn.
Attn. C. E. Hanson, Vice President Charge of Sales

Dear Carl:

Direct from a year's operation in a state pit located near Lonsdale in Southern Minnesota, our Diamond "66" has yet to see downtime, through parts failure. Now it is crushing a steady 150 y.p.h. of 25% crush specification material at a site where the going is heavy and the strain is really on the 30" x 18" roll crusher. And we have seen no downtime yet. The plant's 10" x 36" jaw crusher and 4' x 10' -- 2½ deck vibrator screen are helping to keep our "66" producing day after day.

We'll stick with Diamond plants for a lot of reasons, the chief being that they can take it when the going is rough.

Very sincerely yours,

J V Gleason

J. V. Gleason, Owner

ABOVE: Loading pit-run at 150 y.p.h. Power unit installed over delivery conveyor need not be removed when on road.

BELOW: Dumping pit-run into Diamond shovel-loading hopper. A Diamond grizzly and single eccentric plate feeder keep a continuous, regulated feed.

Everything . . . for the aggregate producer

DIAMOND

DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING CO. DIV.
1766 N. 2ND STREET, MINNEAPOLIS 11, MINNESOTA

IN HAMILTON, ONTARIO—The problem was to install seven miles of 48″ line, fast, to meet the terrific demands of the city's rapidly expanding industrial and residential areas. A $1,900,000 job, including the filtration plant. With confidence, Hamilton engineers specified a Dresser-Coupled steel line.

A DRESSER-COUPLED STEEL LINE

delivers water cheaper

Be Sure you get the best line at the best price. Put steel pipe and Dresser Couplings in your specifications.

The cheapest way to pipe water to where it turns into revenue is with a Dresser-Coupled steel line — the line that cuts *installation* costs, *leakage* losses and *maintenance* expense.

As in the case of this Hamilton line, existing pipe networks often seriously complicate the installation of new mains. Lighter, easier-handled steel pipe joined with Dresser Couplings —simpler to make up, even in cramped ditches—provides the swiftest, most practical way of getting under or around underground obstacles. The line is completed quicker—starts paying its way sooner.

Leakage losses are eliminated. *Controlled gasket pressure*, provided by the bolting up process in a Dresser Coupling, is your assurance of the correct *sealing* pressure all around the joint. Resilient Dresser gaskets absorb stresses from vibration, contraction and expansion, yet keep the joint "flexible-tight".

Maintenance is cut to the bone, too. Dresser Couplings last for life, and the absence of heat in joining prevents damage to glass-smooth pipe linings. High carrying capacity is sustained.

Experience all over the world proves that a Dresser-Coupled steel line gives you the ultimate in performance and economy. See your Dresser Sales Engineer or write our **Bradford Office** for detailed information.

DRESSER

"FLEXIBLE-TIGHT"

COUPLINGS

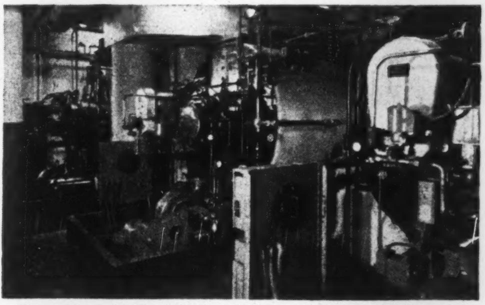
Dresser Manufacturing Division, 59 Fisher Ave., Bradford, Pa. (One of the Dresser Industries). Warehouses: 1121 Rothwell St., Houston, Texas; 101 S. Bayshore Highway, South San Francisco, California. Sales Offices: New York, Philadelphia, Chicago, Houston, South San Francisco. In Canada: 629 Adelaide St., W., Toronto, Ont.

The Washington Post
CAPITAL EDITION
FIVE CENTS
The Weather
Promised
e Hearing
472 Enroll At Central Office

In this modern newspaper building passersby can see running presses through 11 ft. plate glass windows, located directly behind flag pole in this picture.

WASHINGTON POST BUILDING, Washington, D. C. Albert Kahn Associated Architects and Engineers, Inc. John McShain, Inc. — General Contractor. Standard Engineering Company, Engineers and Contractors.

THE WASHINGTON POST'S new 7-story building is heated by a combination of a hot blast ventilating system for the inside areas and convector radiation along the outside walls. The steam distribution system is divided into two sections, one supplying the fan blast coils at 3 lbs. to 5 lbs. pressure and one supplying the radiation at 3 lbs. to 5 lbs. pressure.



Three Cleaver-Brooks 150 hp., oil-fired, self-contained boilers were easily and quickly installed in low headroom, basement space.

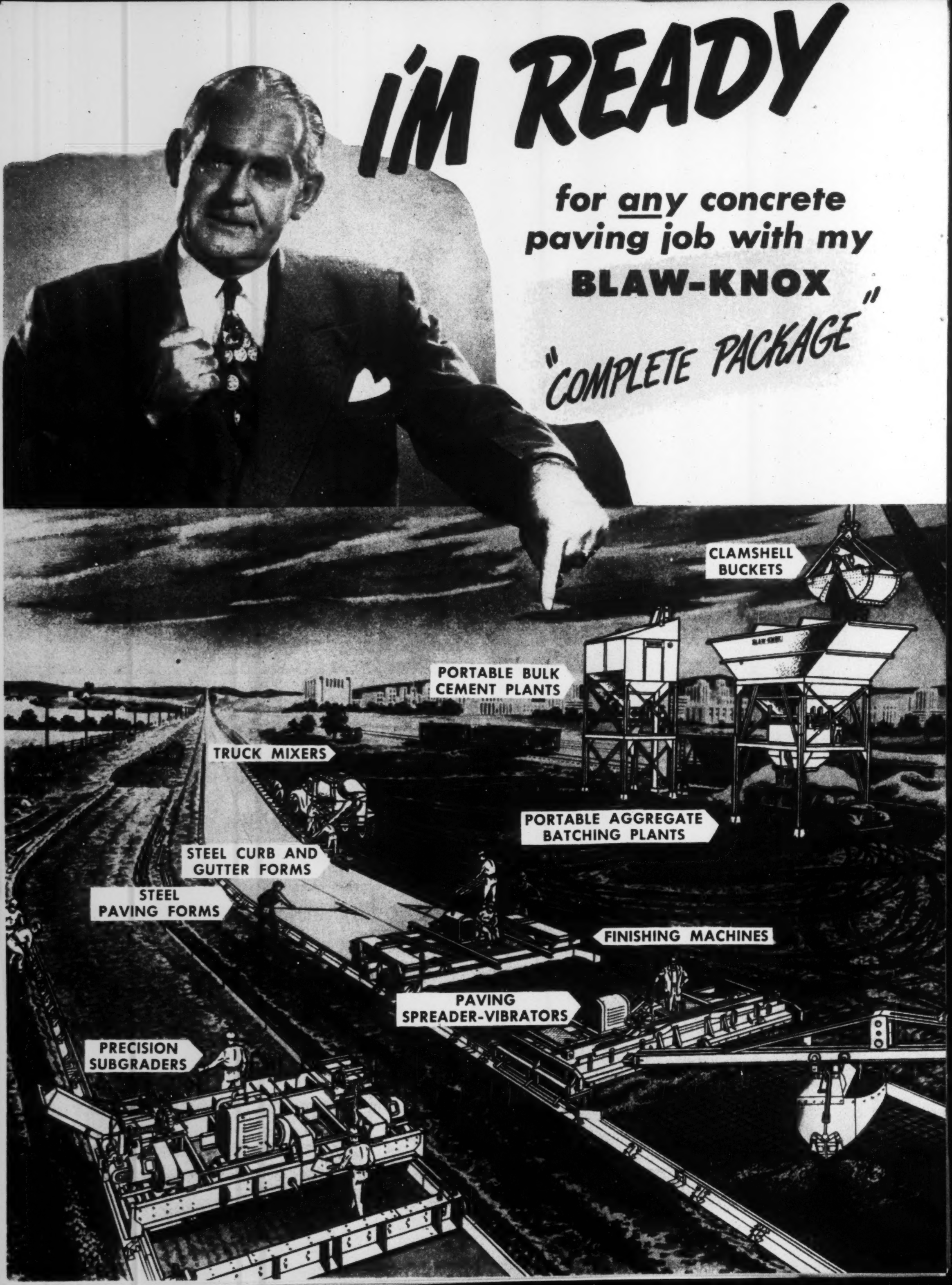
Three Cleaver-Brooks 150 hp. oil-fired, self-contained boilers, installed in the basement location, supply steam for the entire heating system.

Modern Cleaver-Brooks boilers are increasingly specified for heating service. Completely self-contained and compact in design, requiring minimum headroom and floor area, Cleaver-Brooks boilers offer many installation and operating advantages — oil, gas, or combination oil and gas firing — fully automatic — clean — dependable performance — operate at a guaranteed efficiency of 80%. Available in sizes from 15 to 500 hp., 15 to 250 psi.

Write for the latest, fully illustrated Steam Boiler Catalog — Cleaver-Brooks Company, Dept. K, 342 East Keefe Avenue, Milwaukee 12, Wisconsin, U.S.A. *Cable address*: CLEBRO-Milwaukeewis.

Cleaver-Brooks
Originators of Self-Contained
STEAM BOILERS

Oil and Bitumen Tank-Car Heaters • Distillation Equipment • Oil and Gas-Fired Conversion Burners

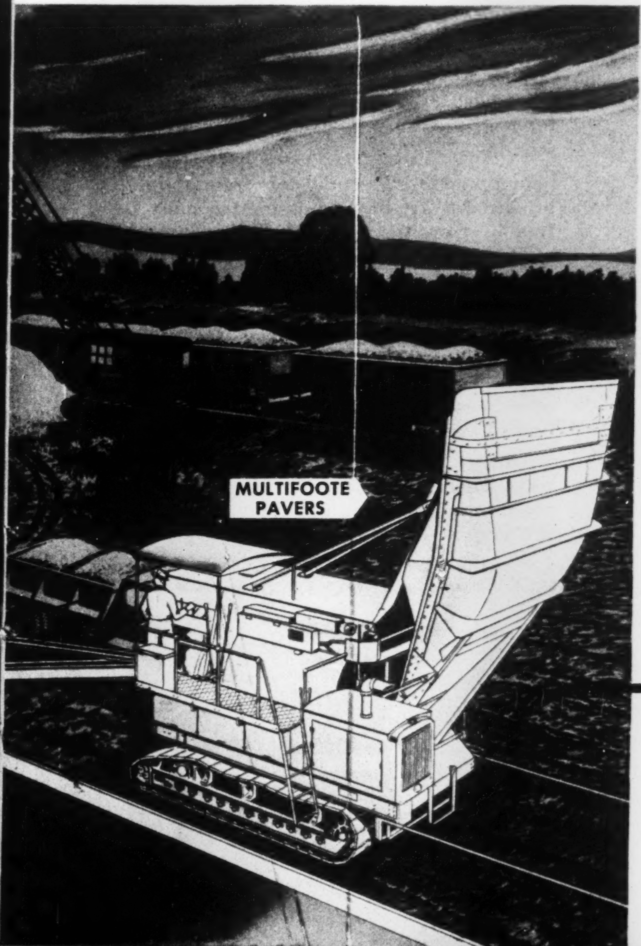

I'M READY
for any concrete paving job with my
BLAW-KNOX
"COMPLETE PACKAGE"
CLAMSHELL BUCKETS
PORTABLE BULK CEMENT PLANTS
TRUCK MIXERS
PORTABLE AGGREGATE BATCHING PLANTS
STEEL CURB AND GUTTER FORMS
STEEL PAVING FORMS
FINISHING MACHINES
PAVING SPREADER-VIBRATORS
PRECISION SUBGRADERS

Superhighways, airports, even dams, bridges, buildings . . . when they're built with concrete, they're duck soup for my Blaw-Knox "Complete Package".

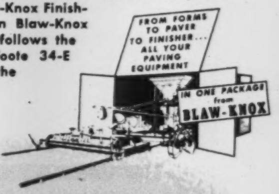
Costs are kept to the absolute minimum! The "Complete Package" contains every piece of equipment needed to assure a steady, balanced production flow with low-cost assembly-line efficiency. The job is 100% mechanized, from handling materials to finishing the slab.

Other reasons why I can operate at lower cost are the "one-source" advantages my Blaw-Knox package gives me. Production steps along at a profit-making clip because wherever I'm working, I can get parts and expert service fast for *all* my equipment, from the nearest Blaw-Knox distributor. Just think—one Blaw-Knox Service Engineer takes care of everything. The entire package is backed by *one* construction-experienced manufacturer who is interested in my success. There's only one financial contact, too . . . that eliminates a lot of bookwork headaches.

With my Blaw-Knox "Complete Package", there's one thing I'm sure of. When the big, juicy contracts come up and they need a man with all the equipment to set up a low-cost job, *I'm ready!*



Blaw-Knox "Package" equipment on the Edens Expressway near Chicago. Blaw-Knox Batching Plants for aggregate and cement were used to insure accurate batching. The Blaw-Knox Spreader with vibratory pan attachment assured satisfactory and economical placement of the low-slump, air-entrained concrete. The Blaw-Knox Finishing Machine, also riding on Blaw-Knox Steel Paving Forms, closely follows the Spreader-Vibrator. A MultiFoote 34-E Dual Drum Paver placed the concrete between the forms.


FROM FORMS TO PAVER TO FINISHER... ALL YOUR PAVING EQUIPMENT
IN ONE PACKAGE from BLAW-KNOX

BLAW-KNOX

BLAW-KNOX DIVISION of Blaw-Knox Company
Farmers Bank Bldg. • Pittsburgh 22, Pa.

NEW YORK • CHICAGO • PHILADELPHIA
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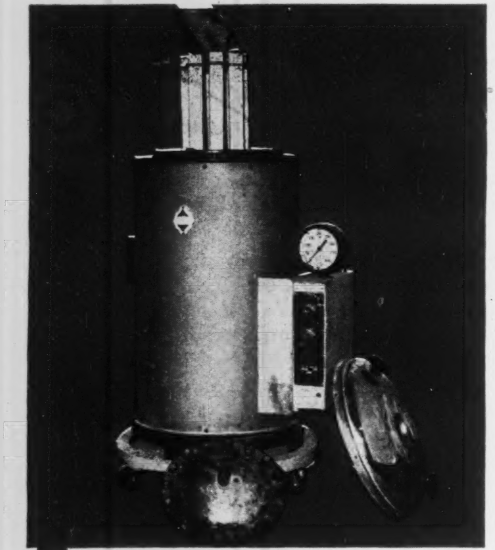
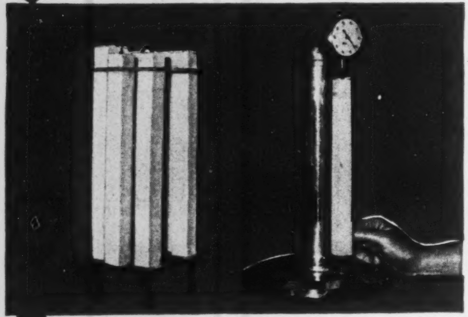
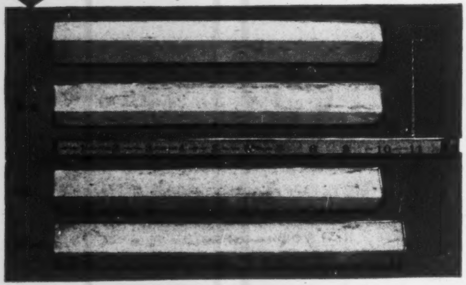


The autoclave test requires the use of a high pressure steam chest (above). Masonry cement bars approximately 1" x 1" x 10" are exposed to 295 lbs. steam pressure, 420° F., for 3 hours. Measurements of the bars are made before and after test as shown below.



Below: Bars of Brixment, and of Portland cement and a lime which does not meet the autoclave test. The expansion of the Portland cement and lime bar, after autoclaving, is quite evident.

B—Brixment, not autoclaved.
B-a—Brixment, autoclaved.
PL—Cement and lime (1 to 1) not autoclaved.
PL-a—Cement and lime (1 to 1) autoclaved.



BRIXMENT MEETS NEW A. S. T. M. AUTOCLAVE TEST!

At its meeting in June, the A.S.T.M. Sponsoring Committee on Masonry Cement recommended a new specification requirement for masonry cement — an autoclave test for soundness.

Sound mortar is essential for strong durable brickwork. To be sound, mortar must be free of constituents which may cause abnormal expansion after long exposure to weather.

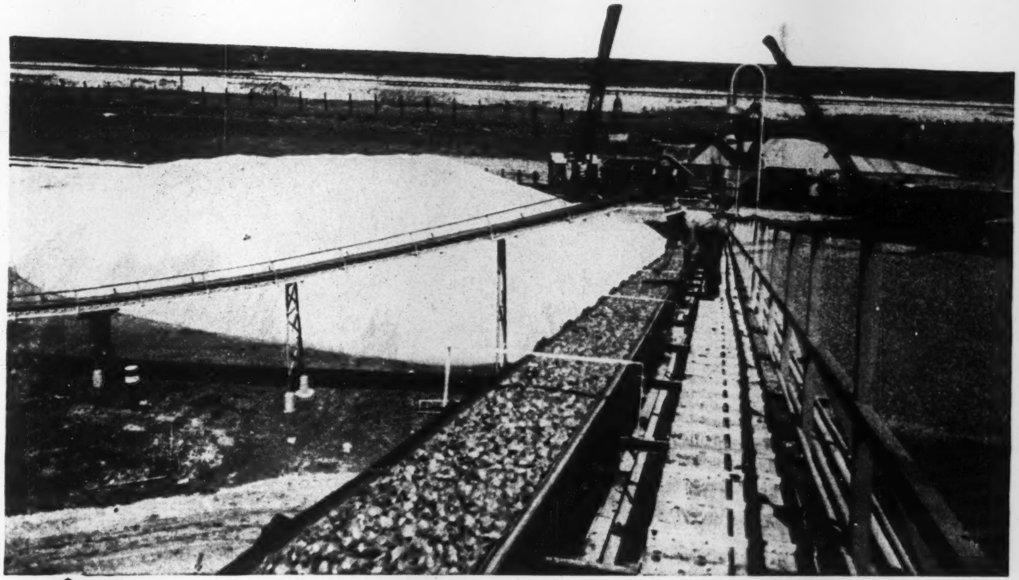
Unsoundness in mortar material is readily detected by the autoclave test. This severe test rapidly accelerates the chemical reaction of mortar materials, and the slightest unsoundness is immediately revealed by excessive expansion.

Brixment more than meets the autoclave test. Therefore when Brixment is used, sound mortar and strong, durable brickwork are assured.

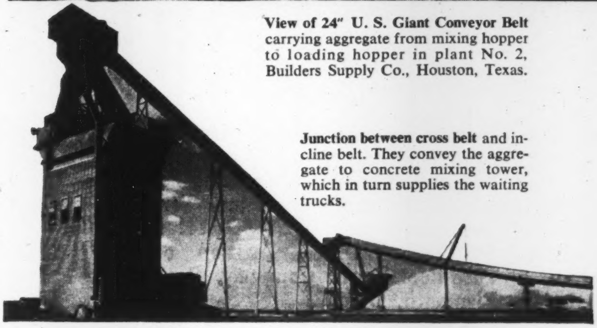
Louisville Cement Company, Incorporated
Louisville 2, Kentucky

BRIXMENT
CEMENT FOR MASONRY
LOUISVILLE CEMENT CO.
BRIXMENT

How U. S. Rubber belt engineers cut installation costs



View of 24" U. S. Giant Conveyor Belt carrying aggregate from mixing hopper to loading hopper in plant No. 2, Builders Supply Co., Houston, Texas.



Junction between cross belt and incline belt. They convey the aggregate to concrete mixing tower, which in turn supplies the waiting trucks.

In a new concrete mix plant, original plans called for the installation of a 5-ply, 36 oz. duck conveyor belt to handle the aggregates. But United States Rubber Company engineers pointed out that their 4-ply, 42 oz. duck belt would not only cost less, but would be more flexible crosswise to trough, would train more easily and provide high-tensile strength as well. This 1,275-foot, 4-ply U.S. Giant Conveyor Belt was installed. It travels 300′ per minute and delivers 294 tons per hour.

This is another instance of why it pays to consult "U.S." engineers before going ahead on a conveyor belt problem. Remember that they are backed by a wealth of experience and vast research facilities. Finally, they will work with your engineers and with the designers of conveyor equipment—a 3-Way Engineering teamwork that always pays off in higher output at lower cost. Write to address below.

PRODUCT OF

U.S.RUBBER
SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

There's a PLYMOUTH Locomotive For YOUR Hauling Requirements!

The *right* locomotive provides *more* than just power. An efficient switcher supplies the right power for the job, handles easily, runs economically, and operates dependably for years with little maintenance.

The 8-ton diesel-powered PLYMOUTH pictured above, operated by a large brick manufacturer in New York, is just one of a complete line of rugged locomotives, engineered for efficient, cost-cutting performance. Numerous reports indicate that company after company has found the right PLYMOUTH Locomotive to meet its needs.

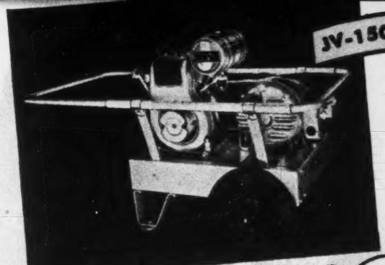
Whether you need a 3-ton or 70-ton model or any size in between . . . standard or narrow gauge . . . gas, diesel, or diesel-electric power, there's a PLYMOUTH Locomotive for YOUR hauling requirements. Send today for new complete catalog.

Every Plymouth Locomotive can be equipped with Plymouth's new Hydraulic Torque Converter for amazing handling ease and smooth operation. Write for information now! PLYMOUTH LOCOMOTIVE WORKS, Division of The Fate-Root-Heath Company, Dept. A-4, Plymouth, Ohio.

PLYMOUTH® LOCOMOTIVES

ALSO MANUFACTURERS OF F-R-H CERAMIC MACHINERY

JV-1500



MODEL JV-1500: 1.5 KVA; 10 amps, single-phase, 7½ amps per phase in 3-phase current; 5.4 HP engine; welded steel rectangular base with wrap-around telescoping handle. Weight: 280 lbs. 120 V.—60 Cy.

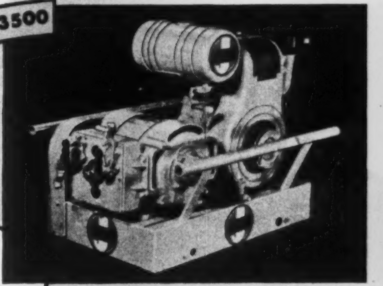
JV-2500

MODEL JV-2500: 2.5 KVA; 18 amps, single-phase, 12.5 amps per phase in 3-phase current; 7.3 HP engine; welded steel rectangular base with wrap-around telescoping handle. Weight: 350 lbs. 120 V.—60 Cy.

JACKSON PORTABLE POWER PLANTS

CAPACITIES FROM 1.5 to 7.5 KVA

JV-3500



MODEL JV-3500: 3.5 KVA; 22 amps, single-phase, 17.5 amps per phase in 3-phase current; 7.3 HP engine; welded steel rectangular skid base with tubular handles. Weight: 360 lbs. Also available wheel or trailer mounted. 120 V.—60 Cy.

featuring

PERMANENT MAGNET GENERATORS
which require no adjustment or maintenance

3-PHASE and SINGLE-PHASE ALTERNATING CURRENT
whichever you want when you want it.

HIGHEST QUALITY – RUGGEDNESS – SIMPLICITY – FLEXIBILITY

JV-5000
JV-7500

IDEAL FOR: Operating all JACKSON Electric Concrete Vibrators, Screeds, Asphalt and Granular Soil Compactors, a wide range of contractors' power tools and lights. See these outstanding Portable Power Plants or write for complete details.

MODEL JV-5000: 5.0 KVA; 36 amps, single-phase, 25 amps per phase in 3-phase current; 20 HP; Skid mounted: 750 lbs.; With separate trailer unit: 1050 lbs. 120 V.—60 Cy.

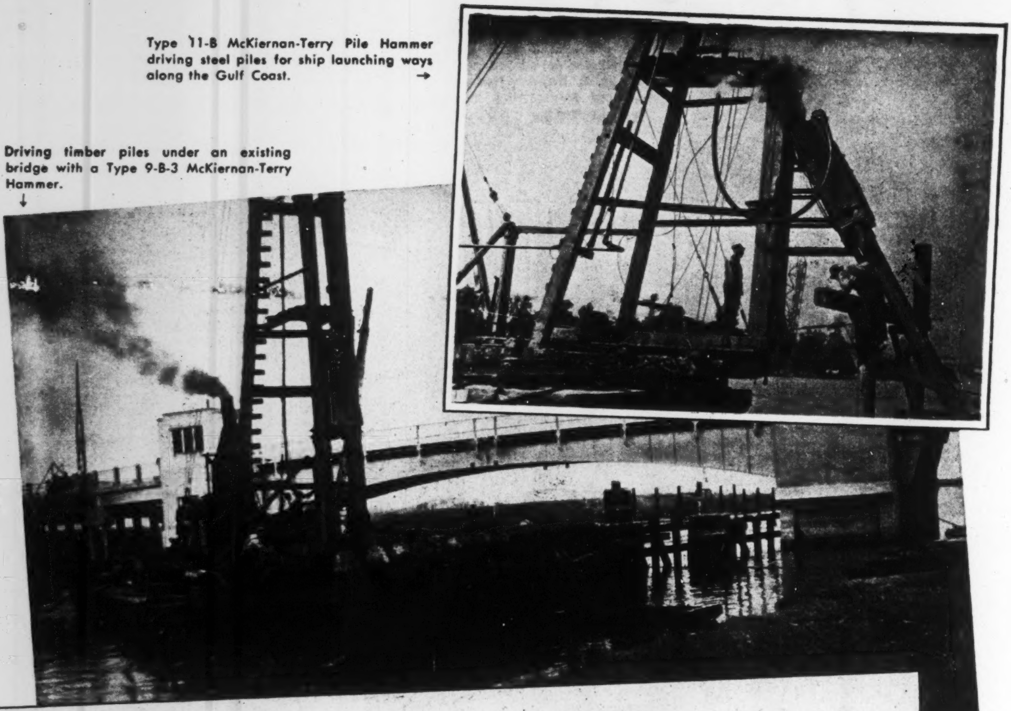
MODEL JV-7500: 7.5 KVA; 40/20 amps single-phase, 36/18 amps per phase in 3-phase; crank or electric starter; 23 HP; weight skid mounted: 1050 lbs.; with trailer: 1350 lbs. 120/240 V.—60-80 Cy.

FOR SALE OR RENT AT YOUR JACKSON DISTRIBUTOR

JACKSON VIBRATORS, INC.
LUDINGTON MICHIGAN

Type 11-B McKiernan-Terry Pile Hammer driving steel piles for ship launching ways along the Gulf Coast. →

Driving timber piles under an existing bridge with a Type 9-B-3 McKiernan-Terry Hammer. ↓



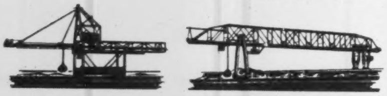
"Our McKiernan-Terry Hammers have consistently made money for us"

The Spence & Howe Construction Company of Port Arthur, Texas, is one of thousands of contractors who have profited by using powerful, fast-acting McKiernan-Terry Pile Hammers. President O. B. Hartzog reports:

"Our two McKiernan-Terry Pile Hammers have always performed beyond expectations and with a minimum of maintenance. They have consistently made money for us, particularly on jobs involving batter piles and difficult places to maneuver heavy pile driving equipment, such as under existing bridge spans, inside of buildings and close to existing refinery units."

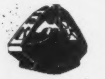
On tough or easy jobs, contractors have discovered that McKiernan-Terry equipment more than pays its way. Get the facts on the wide-range McKiernan-Terry line including 16 sizes of hammers and 2 sizes of extractors. Write for bulletin.

Other McKiernan-Terry Products



MEAD-MORRISON COAL AND ORE UNLOADERS AND BRIDGES

Available in a variety of designs and in capacities of 300 to 1500 tons per hour. Exceptional durability proven by installations in service for half a century. Simple controls afford convenient, comfortable and speedy operation.



GRAB BUCKETS

Range of types and sizes take bulk materials loads up to 25 tons. Ruggedness without excess weight.

HONING UP TO 42-IN. I.D. X 55-FT. LONG

Typical of the extensive facilities of McKiernan-Terry for unusual jobs.

McKIERNAN TERRY

McKIERNAN-TERRY CORPORATION • MANUFACTURING ENGINEERS • 13 PARK ROW, NEW YORK 38, N. Y.

Plants: Harrison, N. J. and Dover, N. J.

MK 327

All 3 Agree GPX is best

FOR ALL TYPES OF CONCRETE CONSTRUCTION

Manufacturer of UNI-FORM Panels

"We have built over 15 million square feet of UNI-FORM Panels, used throughout the country on all types of jobs. On the basis of that experience, plus extensive research, we believe the perfect concrete forming combination is GPX Plastic-faced Plywood used with our frames. That combination is unbeatable in economy, number of re-uses, surface finish and ease of handling," says J. Von Drasek, Vice President and General Manager of Universal Form Clamp Co.

Distributor of UNI-FORM Panels

"In 15 years we rented and sold hundreds of thousands of square feet of UNI-FORM Panels. When Walsh Construction Co. needed 300,000 square feet of forms for the Fairless Works, they specified an all-purpose form with maximum re-usage. We recommended UNI-FORM Panels with GPX facing. With present forming 75% completed, only 3400 square feet of plywood have been replaced—conclusive proof that the combination of UNI-FORM Panels with GPX facing provides the best all around prefabricated wall form," says Harold O'Callaghan, President of Universal Builders Supply Co., Inc.

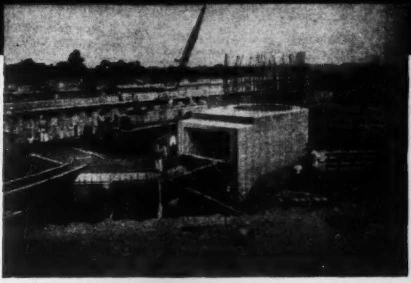
Contractor-user of UNI-FORM Panels

H. H. Dugan, Vice-President and Job Manager of Walsh Construction Company, sponsor for the Walsh-Perini-Groves-Slattery Companies, general contractors who are responsible for all of the foundation work, roads and utilities for the United States Steel Company Fairless Plant, said that 300,000 square feet of forms were required to pour approximately 700,000 cubic yards or about 7 million square feet of concrete surface. Approximately 90% of this form area was formed with 300,000 square feet of UNI-FORMS faced with plastic plywood. The GPX in the uniforms helped them to average 20 to 25 re-uses. These forms saved time, labor and money. "GPX takes an awful beating. We're sold on it," said Mr. Dugan.

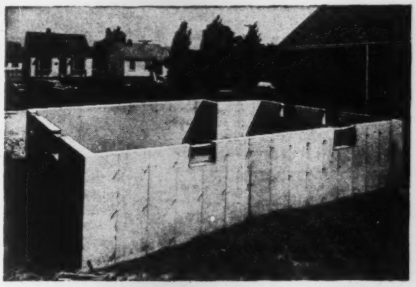
Whether pre-fab forms or forms constructed on the job, you'll find GPX Plastic-faced Plywood the perfect forming material for speedy, time-saving, cost-saving jobs. Send for descriptive GPX folder. Georgia-Pacific Plywood Company, 610-9A North Capitol Way, Olympia, Wash.

GEORGIA—PACIFIC
PLYWOOD COMPANY
610-9A North Capitol Way, Olympia, Wash.

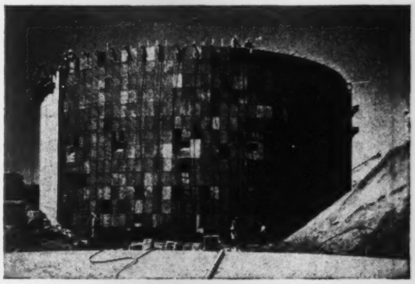
OFFICES OR WAREHOUSES IN: Augusta, Birmingham, Boston, Chicago, Cleveland, Columbia, Detroit, Houston, Lancaster, Los Angeles, Louisville, Memphis Nashville, Newark, New Hyde Park, New Orleans, Olympia, Orlando, Philadelphia, Pittsburgh, Providence, Raleigh, Richmond, Savannah, Vineland.



This foundation for part of U.S. Steel's Fairless Works is but one of the many foundations that utilized UNI-FORM Panels using GPX Plastic-faced Plywood. A hundred re-uses in repetitive forming is common. Two hundred is not unusual.



This House Foundation by Concrete Engineering Company, Whiting, Indiana, shows the smooth surface of unfinished concrete made with UNI-FORM Panels, using GPX Plastic-faced Plywood.



In circular tanks, like this Sewage Treatment Plant in Dallas, Texas, savings in material and labor, using GPX faced UNI-FORM Panels, have reduced costs as much as 70%. Cullum and Whittle of Dallas were the contractors on this job.

DOUGLAS FIR PLYWOOD • HARDWOOD PLYWOOD • GPX • SOUTHERN & WESTERN LUMBER • DOORS

Can you match performance

HAUL one way	TRIPS per hour (per unit)	PAY YDS. per hour (per unit)	Name of Owner	Job Description	Type of Material	Job Conditions
140′	22	110	W. W. Allen *Conneaut Lake, Pa.*	2 "D's" grading 20,000 yds. for school near Greenville in 12 8-hour days.	Clay, 25% very wet.	Part self-loaded, part motor-patrol push-loaded.
150′	Not counted	125 self-loaded	Griggs County Soil Conservation District *Cooperstown, N. D.*	1 "D" digging 250-yd. drainage ditch near Aneta.	Sandy loam.	Normal for drainage ditch.
100′-300′	17	Not measured	Macbeth & Company, Inc. *Montebello, Calif.*	1 "D" supplying sand for gunite filler at Whittier Narrows Dam, Whittier.	Very fine, dry sand.	Selective loading: 1½% max. moisture . . .25% to pass «100 screen.
200′	30	150 self-loaded	Roy Jones, Contractor *Ipswich, S. D.*	1 "D" building one 1500-yd. dam per day for Edmunds County.	Sandy clay and gravel.	Material sun-baked, extremely dry.
200′	25	137½ self-loaded	Roy Kohl, Contractor *Springfield, Ohio*	1 "D" grading 45,000 yds. for industrial plant site at Yellow Springs.	Mostly loam, clay, with occasional gravel.	Good weather, level grades.
200′	14	70	J. P. Hollerich Co. *LaSalle, Ill.*	2 "D's" digging 5000-yd. lake for LaSalle farmer.	Wet gumbo.	"Shutdown" conditions . . . loading belly-deep mud . . . haul up 10% grade.
300′	36	198	Kelly Contracting Company *Louisville, Ky.*	1 "D" on 80,000-yd. relocation of U. S. 62 from Kuttawa to Kentucky Lake Dam.	Gravel.	Ideal conditions.
300′	24	96	Damodar Valley Corp. *Calcutta, India*	12 "D's" reclaiming 200,000 acres of wasteland for rice farms at Hazaribagh.	Sunbaked clay.	No haul roads, 130° F., dry, dusty.
300′	22	138 self-loaded	Domres Bros. *Manistee, Mich.*	1 "D" extending runway from 2200′ to 4000′ at Manistee's Blacker airport.	Sand and sandy loam.	Poor footing in soft, loose, abrasive material.
350′	23	137½	Great Lakes Const. Co. *Cleveland, Ohio*	2 "D's" on 25,000 cu. yd. widening of Cleveland's Lake Shore Highway.	Sandy topsoil.	Return up 12% grades.
300′-400′	23	125 self-loaded	C. H. Wilhelm *Faulkton, S. D.*	1 "D" on one of a series of soil conservation dams near Faulkton.	Dry, sandy clay.	Hard material. 15-19% grades on return.
300′-500′	20	120 self-loaded	William Cinader *Clawson, Mich.*	1 "D" leveling 25,000-yd. subgrade for 550-home Royal Oak subdivision.	Topsoil and clay.	Tight quarters . . . haul and spread among houses, foundations.
400′	27	189	E. C. Pfeiffer *Edina, Minn.*	2 "D's" grading roads, stripping topsoil, excavating basements, for Edina subdivision.	Sandy clay and loam topsoil.	Ideal conditions, slight grades, moist material.
400′	17	85 self-loaded	J. Ralph Fenton *Longview, Texas*	1 "D" completing 17,000-yd. Richardson & Ware highway job near Longview.	Heavy clay.	Clay surface slippery from heavy rains.
400′	32	160	Roy Kohler *Clovis, Calif.*	2 "D's" push-loading each other on 16,500-yd. land-levling near Clovis.	Common earth.	Negligible grades.
400′	12	Not measured self-loaded	P. W. Ryan Sons *Janesville, Wis.*	2 "D's" widening shoulders along 10 miles of U. S. 14 near Walworth.	Wet loam and gravel.	Haul through heavy traffic (6000 cars daily).
450′	26	156	Hollingsworth Const. Co. *Dallas, Texas*	1 "D" leveling building sites and grading streets for 78,000-yd. Walnut Hill Shopping Center near Dallas.	Sun-baked clay and loam.	Haul through traffic over city streets and across busy 4-lane highway.
450′	20	100	S. A. Cummings *Compton, Calif.*	2 "D's" on 30,000-yd. leveling job at Riviera subdivision, Pico.	Sandy loam.	Close maneuvering between trees, buildings.
450′	16	88 self-loaded	A. E. Williams Const. Co. *Hartford, Conn.*	1 "D" on 50,000-yd. Chester Bowles Park subdivision, Hartford.	Loam.	Frequent delays for workmen, trucks, instructions.
450′	12	60	L. B. McCowan *Eggertsville, N. Y.*	4 "D's" stripping and stockpiling 35,000 yds. for defense plant at Akron.	Heavy, wet, sticky clay	Continual rainfall, deep mud pockets.
500′	21	110 self-loaded	Gardner Brothers *Excavating Co.* *Barberton, Ohio*	2 "D's" building streets for subdivision in East Greenville.	Clay.	Haul up grades to 5%.
600′	17	85 self-loaded	George R. Stacy *Tulelake, Calif.*	2 "D's" on 1,100,000-yd. Lost River Canal Near Klamath Falls, Oregon.	Alkaline silt, hardpan.	Soft loading area.
600′	15	75	Roy Kohler *Clovis, Calif.*	2 "D's" push-loading each other on 16,500-yd. land-leveling near Clovis.	Common earth.	Average for land-leveling, dry, negligible grades.
660′	17½	Not measured self-loaded	Sugden & Sivier, Inc. *Hazel Park, Mich.*	4 "D's" moving 450,000 yds. for new race track near Detroit.	Topsoil.	Precision spreading.
700′	17	Not measured self-loaded	Shely Construction Co. *Lexington, Ky.*	1 "D" on 40,000-yd. landing field for CAA at Georgetown.	Clay.	Average.
700′	15	75 self-loaded	Sorenson Bros. *Murray, Utah*	1 "D" land-leveling 15,000 yds. at Jeremy Ranch, Salt Lake City.	All Clay.	Rough haul roads.
800′	24	140 self-loaded	Leo Carroll, Contractor *Kalkaska, Mich.*	1 "D" converting 2 acres of swamp land into building lots at Kalkaska.	Sand and gravely sand.	300′ of 20% grade.
950′	16½	90 self-loaded	Roy Kohl, Contractor *Springfield, Ohio*	1 "D" grading 45,000 yds. for new industrial plant in Yellow Springs.	Loam, clay; gravel in spots.	Haul grades up to 10%.
980′	18	Not measured self-loaded	Jose Augusto de Matos *Sao Paulo, Brazil*	2 "D's" grading 5 miles of streets for a new Sao Paulo subdivision.	Topsoil, clay and sand.	6% adverse grade on return.
980′	Not counted	54½ self-loaded	Burns Brick Co. *Macon, Ga.*	2 "D's" loading clay for brick manufacture at Macon.	Alluvial clay.	Selective loading, 5-15% adverse grades. Very slippery when wet.
1000′	15	91	Evans Contracting Co. *Quitman, Miss.*	3 "D's" excavating drainage channel on Route 71 near Clifton, La.	Muck and sand.	Material very wet, filled with roots.
1000′	17	85 self-loaded	Anglo-Thai Corp., Ltd. *Bombay, India*	2 "D's" relocating 18 miles, 532,700 yds. of the Bombay-Ahmedabad Coastal Highway between Tawa and Talasarl.	Clay and rock.	Working through jungle undergrowth; dry, hard soil.
1000′	13	74	Southern Hills Pit, Inc. *Dayton, Ohio*	1 "D" pusher-loaded on 78,000-yd. leveling job for Forsythe Apartments, Dayton.	Clay and topsoil.	Sharp turns to load, dump between buildings, trees.
1000′	11½	63 self-loaded	Southern Hills Pit, Inc. *Dayton, Ohio*	1 "D" on same Forsythe housing job at Dayton.	Clay and topsoil.	Sharp turns to load, dump between buildings, trees.
1000′	12	66 self-loaded	Shely Construction Co. *Lexington, Ky.*	1 "D" building roads, walkways, for 20,000-yd. Ashland Park subdivision.	Red clay.	Haul over 4% grades.

# of these 113 "D" Tournapulls?

HAUL one way	TRIPS per hour (per unit)	PAY YDS. per hour (per unit)	Name of Owner	Job Description	Type of Material	Job Conditions
1000'	12	54 self-loaded	C. W. Frysinger Const. Co. *Columbus, Ohio*	4 "D's" on 6 miles, 58,000-yd. fine-grading and backsloping, Rt. 18 near Tiffin.	Topsoil, clay, sand and silt.	Self-loaded around poles, culverts. Haul through traffic.
1100'	17	114	Lawrence County *Moulton, Ala.*	1 "D" on 11 miles of new farm-to-market road near Moulton.	Typical Alabama red clay.	Average conditions.
1100'	13.3	70 self-loaded	Lawrence County *Moulton, Ala.*	1 "D" pusher-loaded on same Moulton road job.	Alabama red clay.	Average conditions.
1100'	10	52 self-loaded	White Construction Co. *Kinston, N. C.*	1 "D" moving sand to Asphalt plant at Greenville.	Loose sand.	Soft footings, abrasive material.
1200'	10	50 self-loaded	Rhoten & Frysinger Construction Co. *Columbus, Ohio*	1 "D" finishing on 10-mile subgrade for U. S. 30 in Crawford and Wyandot Counties.	Topsoil, clay and silt.	Load around poles, culverts. Share road with rock trucks.
1250'	14	84	Hutchinson & Wyatt *Sandyville, W. Va.*	2 "D's" extending taxiways at Kanawha County Airport, Charleston.	Rock-hard, sun-baked clay.	Extremely dry, tough materials.
1350'	13	71	Ham & Timmer *Grandville, Mich.*	2 "D's" on 100,000-yd. real estate grading job at Grand Rapids.	Pure Michigan blow sand.	Very loose footing . . . 200-250# rolling resistance.
1500'	14	70	L. M. Staker Const. Co. *Ames, Iowa*	3 "D's" filling for detour bridge approach on U. S. 30 at Ames.	Black gumbo.	4"-6" frost, haul across busy highway.
1600'	17½	105	Sugden & Sivier, Inc. *Hazel Park, Mich.*	4 "D's" grading, building 450,000-yd. race track near Detroit.	Fill 9" sand, 8" clay, 3½" topsoil and clay.	Precision spreading, banking track. Haul in traffic.
1640'	8	46 self-loaded	Roberto G. Mendoza *Havana, Cuba*	3 "D's" building new 595,000-yd. market route to Minas, Province de Camaguey.	Limestone, peat, and red clay.	Inexperienced operators. Hard, unrooted material. Rainy weather.
1700'	12	84	Evans Contracting Co. *Quitman, Miss.*	3 "D's" rebuilding 165,000-yd. highway Mount Herman to Clifton, La.	Silty clay and chalk.	Short grade from pit . . . dump in small area.
1700'	10	50 self-loaded	Sam Glasgow, Contractor *Glenside, Penn.*	1 "D" leveling industrial plant site in Philadelphia.	Sandy clay.	Average conditions.
1850'	11	66	Finley P. Smith Const. Co. *Fort Lauderdale, Fla.*	3 "D's" building 136,000-yd. grade separation over U. S. 1, north of Ft. Pierce.	"Ball bearing" ocean sand.	Haul across tracks, main highway.
2000'	10	50 self-loaded	Saprar-Lalitpur Division, Uttar Pradesh Govt., *Jhansi, India*	2 "D's" on earth fill for 1,722,000-yd. Saprar Dam at Mau Ranipur.	Clay and rock.	Very dry, dusty. Rough, hilly haul.
2100'	11	55 self-loaded	Acme Brick Co. *Fort Worth, Texas*	1 "D" hauling shale for asphalt manufacture at Bridgeport.	Slacked shale.	Normal.
2200'	10	50 self-loaded	Barnhill & Long *Tarboro, N. C.*	4 "D's" moving 250,000 cu. yds. to raise roadbed above water level near Kinston.	Wet sand, clay.	Self-load under water 75% of time . . . narrow road.
2200'	12	60	H. W. & E. L. Von Dorsten *Woodland, Calif.*	2 "D's" on 50,500-yd. land-leveling job at Winters.	Clay, sandy loam.	Very dry soil.
2200'	10½	42 self-loaded	Macbeth & Company, Inc. *Montebello, Calif.*	1 "D" leveling for buildings, streets, walks on housing projects at Paramount.	Hard, dry, silty loam.	Haul across curbs, concrete pavement.
2400'	8	40	Roy Kohler *Clovis, Calif.*	2 "D's" repairing levee near Clovis.	Gumbo.	Wet material.
2580'	12	72	Young Bros. *Waco, Texas*	2 "D's" on 30,000-yd. drainage channel and leveling for Kilgore Hospital.	Tight-laying topsoil and sandy sod.	1700' uphill across field, 880' heavy traffic.
2640'	10	60	W. B. Bennett Paving, Ltd. *Oshawa, Ontario*	2 "D's" handling 9,000-yd. subgrade for city streets in Oshawa.	Sandy clay mixed with small stones and old road-surfacing.	Load around manholes. Haul ½ mi. through traffic.
3000'	7½	41	Kelly Contracting Company *Louisville, Ky.*	1 "D" on 9 mile, 80,000-yd. relocation U.S. 62, Kuttawa to Kentucky Lake Dam.	Gravel.	Normal.
3200'	7	42	Chippewa County *Chippewa Falls, Wis.*	3 "D's" on 100,000-yd. relocation of Highway M.	Glacial sand.	Abrasive materials. Level haul.
3900'	3½	18	Societe Francaise d'Entreprises de Dragages et de Travaux Publics, *Dakar.*	3 "D's" building 70-mile all-weather road between Kaolack and M'Bour, French West Africa.	Sand.	Loose footing with 125# rolling resistance . . . dry, dusty material.
3960'	5	30 self-loaded	Dave Kornoely *The Heights, Mich.*	2 "D's" grading 8000 yds. for 500-car Drive-In Theater at The Heights.	Gravel and gravely loam.	Precision grading. Haul over winding road.
4000'	6½	35	Luety Bros. *Beloit, Wis.*	2 "D's" on 160,000-yd. relocation of U. S. 151, south of Mineral Point.	Mostly blasted rock and clay.	Rough, narrow, winding haul. Return grades to 10%.
4000'	5	35	Noel Brothers *Greeneville, Tenn.*	1 "D" filling foundation walls and columns of tobacco warehouse.	Extremely hard, dry clay.	Load, dump betwen warehouse walls, columns.
4400'	5	22.5 self-loaded	Dane County *Madison, Wis.*	3 "D's" improving city streets in Verona.	Sand, gravel.	Haul through traffic. Spread in soft mud holes.
5280'	6	36	Fort York Const. Co., Ltd. *Toronto, Canada*	3 "D's" on 5-mile, 300,000-yd. road through muskeg, Matheson to Swastika.	Sand, mixed with clay, rock.	Material loose, rough. Haul over soft muskeg.
5500'	9	49½	J. K. Hodgman Const. Co., Inc. *Fairmont, Minn.*	2 "D's" on 7-mi., 210,000-yd. relocation of State Highway 4 near Dunnell.	Dry, loamy clay.	Dry, dusty, but generally excellent haul roads.
10,000'	2¾	12	Taylor Bros. Co., Inc. *Birmingham, Mich.*	1 "D" hauling fill for street paving job in Birmingham.	Gravel top with gumbo beneath.	Entire haul in heavy city traffic at 25 m.p.h.

D Tournapull: 7 yds., hea[illegible] 122 h.p. [illegible] speeds to [illegible] m.p.h.

R. G. LeTOURNEAU, INC., Peoria, Ill.

HIGH-SPEED, RUBBER-TIRED EXCAVATING • HAULING • LIFTING EQUIPMENT

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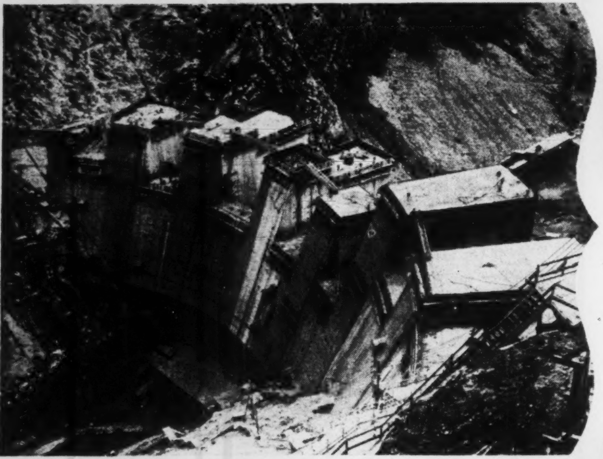
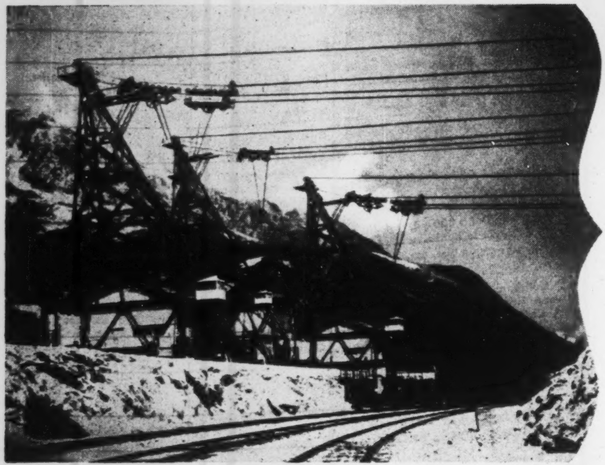
3 LIDGERWOOD high speed electric Cableways



HELP BUILD EUROPE'S TALLEST DAM

Rising 592 feet above the ground, the Tignes Dam, located in the French Alps, presents many unusual construction problems. Freezing temperatures cut the working season to less than six months. To handle the vital job of placing concrete, engineers for Electricite de France selected



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designed and built by Lidgerwood Industries.

- **Two 25-ton Cableways for handling 8 cubic yard buckets.**
- **One 10-ton Service Cableway.**

All three are radial type with traveling head towers and a common pivotal tower. Spans average 1950 feet.

Designers and builders of Special Large Hoisting Machinery of every type; Electro-Hydraulic Marine Auxiliary Machinery; "Denny-Brown" Ship Stabilizers and Construction Equipment; Cableways up to 150 ton capacity.

LIDGERWOOD INDUSTRIES

7 DEY STREET, NEW YORK 7, N. Y.

"IT IS EASY TO HANDLE AND DOES A PERFECT JOB". . . The Schramm *Pneumatractor* this operator is describing, is working on a tough job for the Potter-DeWitt Corp., Pavilion, New York.

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SCHRAMM CONSTRUCTION TOOLS

ROCK DRILLS
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The operator finds the Schramm *Pneumatractor* a "vast improvement, now we don't have to wait for a dozer or truck. Just get on it and move it ourselves," he says. ". . . Change from tractor to air compressor or vice versa in an instant."

The Schramm *Pneumatractor* operates as both tractor and air compressor at the same time. It will PUSH, PULL, POWER anything a wheel tractor will, and PROVIDE AIR for any pneumatic tool that can be operated from a 105 cu. ft. air compressor.

You, too, will find the *Pneumatractor* ideal for your varied jobs. For full details, write today for Bulletin Neu-52.

SCHRAMM INC.
The Compressor People
WEST CHESTER PENNSYLVANIA

STRETCHING YOUR HIGHWAY DOLLARS with RUBBER ROADS

Ten countries and seventeen states in the U. S. A. now have test stretches of rubber roads. Massachusetts has over 300 miles of rubber roads. The City of Baltimore last month, after a two-year test, ordered the first routine application of rubber asphalt paving on a city street. One of the most heavily travelled highways in Holland has a stretch of rubber road that has required no maintenance in over 15 years.

These facts are significant to every highway engineer and state and municipal official interested in stretching highway dollars.

Only time and testing will tell how many dollars the addition of natural rubber powder to the asphalt top surfacing of a highway will save. But all the evidence to date indicates that the saving will be substantial.

Would you like to know more about rubber roads?

We suggest three ways.

First, write for a free copy of the 52-page booklet — "Stretching Highway Dollars With Rubber Roads". This booklet gives the whole story on the history of rubber roads, describes in detail the test roads using natural rubber powder that have been laid in the United States and Canada through the 1951 paving season.

Second, ask for a free showing of the new motion picture — "Stretching Highway Dollars With Rubber Roads". Produced by United World, it is a 16 mm., 30-minute sound presentation of the rubber road story to date, including actual showings of test roads, the opinions of the highway engineers who have laid them, and a tour of the Natural Rubber Bureau Research Laboratory, in Rosslyn, Virginia.

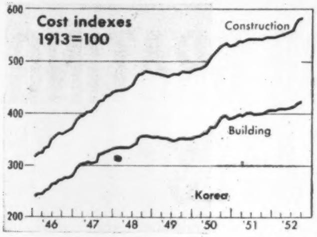
Third, visit the Natural Rubber Bureau's Research Laboratory yourself and see how the effect of rubber powder mixed with asphalt and tar is being studied with the most modern laboratory equipment available.

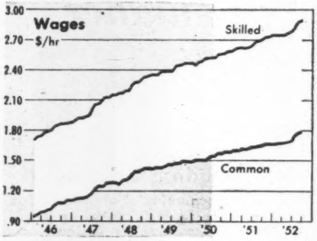
Rubber roads are the most promising development in highway construction in recent years. If you are interested in pavements with more elasticity, with less susceptibility to temperature variations, less brittleness at low temperatures, and more resistant to shock and vibration — in other words, more wear at less cost — then you will want to know more about rubber roads.

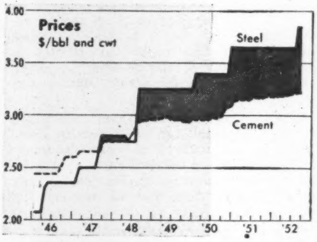
Natural Rubber Bureau 1631 K STREET, N. W., WASHINGTON 6, D. C.

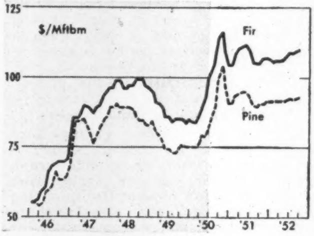
NATURAL RUBBER BUREAU RESEARCH LABORATORY . . . 1101 Lee Highway, Rosslyn, Va.

SEPTEMBER CONSTRUCTION SCOREBOARD









ENR INDEXES (1913=100), 20-cities' average	1952 September	% Change from last Month	% Change from last Year
Construction Cost	586.47	+0.5	+ 8.0
Building Cost	424.79	+0.6	+ 6.1
WAGE RATES, 20-cities' average			
Common	$1.803	+0.5	+10.1
Skilled (aver. 3 trades)	2.909	+0.8	+ 7.7
Bricklayers	3.237	+1.4	+ 8.9
Structural Ironworkers	2.847	+0.5	+ 7.1
Carpenters	2.643	+0.4	+ 6.9
MATERIAL PRICES. 20-cities' average			
Cement, bulk, per bbl	$3.219	0.0	+ 1.6
Structural Steel, (3-mill aver.), per cwt	3.850**	0.0	+ 5.5
Sand, per ton	2.108	0.0	+ 0.9
Lumber, 2x4 Fir, per M. ft. bm	110.083	+0.07	+ 5.2
Lumber, 2x4 Pine, per M. ft. bm	93.066	+0.5	+ 2.7
Common brick, per M	31.601	0.0	+ 1.7
Ready-mixed concrete, per c. y	11.231	+0.2	+ 3.2
Structural Clay Tile, 3x12x12 per M	151.288	0.0	+ 2.5

** Revised in Aug.

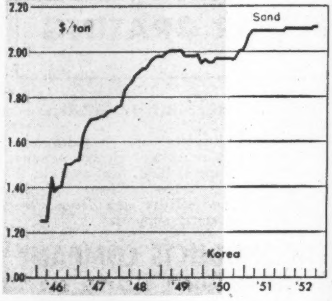
CONTRACTS AWARDED (Millions)	1952 August (4-Weeks)#	1952 8-Mos.	% Change from '51 August (5-Weeks)#	% Change from '51 8-Mos.
Total U. S. (ENR reported)	$2,210.6	$11,303.8	+141.2	+ 15.2
Private	503.4	4,688.5	+ 4.6	− 9.6
Public	1,707.2	6,615.3	+291.9	+ 43.2
Federal	1,412.9	3,732.7	+954.3	+110.9
ENR Volume Index, '13=100	1,082	627	+139.4	+ 11.4
NEW CAPITAL (Millions)				
Total	428.0	12,586.9	+ 12.4	+ 82.4
State & Municipal Bond Sales*	146.2	2,186.6	− 5.9	+ 36.2
Corporate Security Sales	154.6	2,607.1	− 20.8	+ 17.9
Federal (non-federal work)	77.2	852.7	+552.2	+832.4
Federal (federal work)	50.0	6,940.5	+176.4	+131.8

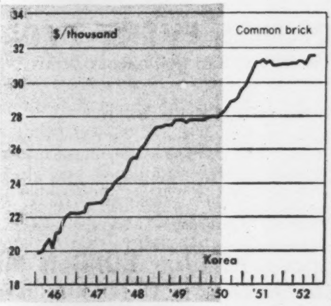
* Excluding public housing.

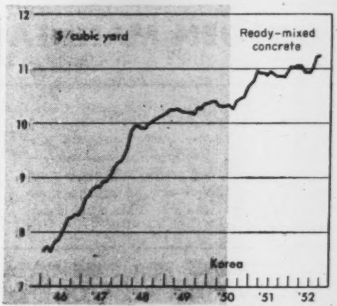
# Computed on Weekly Aver.

MATERIAL SHIPMENTS & LABOR SUPPLY (Millions)	1952 June(6) July(7)	1952 6-Mos.(6) 7-Mos.(7)	% Change from '51 Mo.	% Change from '51 Yr.-Cum.
Cement, bbls, Bu. of Mines	25.067(6)	113.164(6)	+ 0.6	+1.1
Fabr. Struc. Steel, tons, AISC	.136(7)	1.496(7)	−33.3	−4.9
Lumber, mil. ft. bm., NLMA	3.031(6)	18.131(6)	− 4.4	−7.6
Lumber Prod., mil. ft. bm., NLMA	3.193(6)	18.153(6)	−12.7	−9.1
Contract Constr. Employ., BLS	2.729(7)	2.462(7)†	− 0.9	−0.6

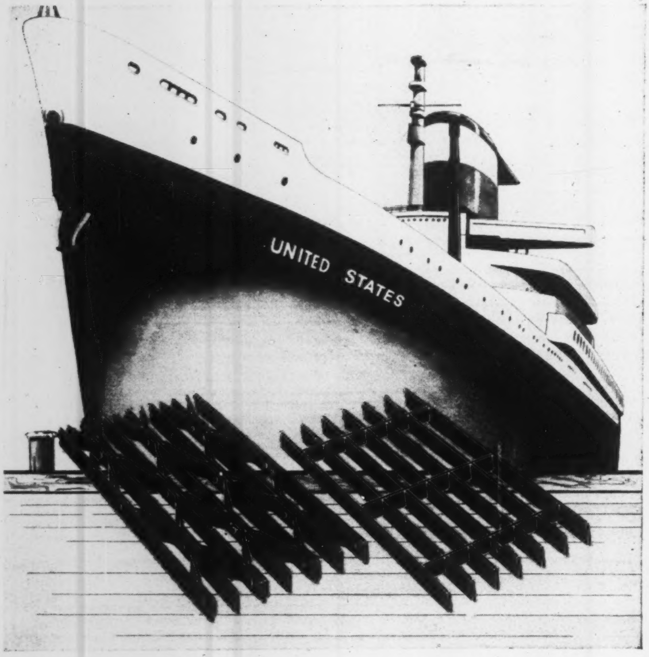
† Average.







ENR Business News



BORDEN ALUMINUM FLOOR GRATING ON S.S. UNITED STATES

Aluminum grating now only slightly higher than conventional steel gratings

Brings all advantages of aluminum floor gratings within building budgets

Seen as the beginning of a new trend in construction, the rapidly expanding use of aluminum floor gratings for building was predicted today by the Borden Metal Products Co., Elizabeth, N. J. and Leeds, Ala. This company supplied much of the aluminum grating for the S. S. United States, and currently has orders amounting to many thousands of square feet for ships, power houses, sewage plants, and water-treatment works.

Borden, through many years of planned production control, can now produce aluminum floor gratings by the same commercial methods used for ordinary steel gratings. Thus the ultimate in-place cost is only slightly higher than that of conventional gratings — bringing all the advantages of aluminum to the building industry.

The installation of Borden aluminum floor gratings in the S. S. United States saved approximately one-half the weight of steel gratings. The lightness of the aluminum alloy permits sections to be removed in case of emergency or engine trouble. With 85% open construction in the grating, maximum light and air can circulate — extremely important around machinery.

Once installed the floor gratings need never be painted; the resultant savings in man hours alone makes up any difference in price. And their exclusive non-corrosive feature is extremely important to specifying engineers and architects, constructing chemical, sewage and water-treatment plants.

BORDEN MANUFACTURES EVERY TYPE FLOOR GRATING

IN FERROUS AND NON-FERROUS METALS

BORDEN ALL-WELD DESIGN

The best type for use where floors are subject to extreme corrosion or moisture — chemical plants, breweries and other process industries. There are no cracks, open joints, or holes in bars. This type made only in mild steel.

BORDEN RIVETED DESIGN

Most substantial and oldest design of grating made, permits perfect distribution of loads. Made on the truss principle, Borden Riveted Gratings are hydraulically power-forged for strength and durability. Particularly recommended for aluminum.

BORDEN PRESSURE LOCKED DESIGN

Neat, clean, durable, easy to paint and maintain. Pressure Locked Design permits maximum passage of light, heat and air. It is especially desirable in power plants, boiler rooms and all dry area. Deep cross bars increase lateral support.

SEND FOR FREE CATALOG COVERING ALL FLOOR GRATINGS

BORDEN METAL PRODUCTS COMPANY
815 GREEN LANE   Elizabeth 2-6410   ELIZABETH, N. J.
SOUTHERN DIV.—LEEDS, ALA. — MAIN PLANT—UNION, N. J.

- **Atom impact**—Just what the Atomic Energy Commission's newest expansion moves (ENR Aug. 21, p. 21) will mean to the construction industry can be assessed this way:

AEC will now be accounting for 5% of the nation's monthly construction spending (now running at something like $2.7 billion a month);

AEC will be using something like 2% of the nation's available electric power;

AEC will employ about 2% of the nation's estimated 150,000 civil engineers.

- **Meaning**—Just what the impact of this program can mean to construction can be seen quickly by assessing just one item: electric power.

There's a tough behind-the-scenes battle moving into the showdown stage in Washington now, a battle for steel for electric utility expansion.

The fight adds up this way: AEC (needing an additional 6.3 million kw of electric power by early 1956) wants top priority for materials that will go into power plants to serve its installations. But Defense Electric Power Administration (claimant for all electric utilities) argues that such a priority will disrupt the whole power program and unduly delay construction of plants to serve other defense needs.

The infighting is long and complicated, but observers set up the situation like this: The steel strike set back power expansion by about four months. If AEC gets further priority authority, the general expansion program will be set back six or seven months.

- **Hope on living costs**—Although the U. S. Cost of Living index went to new highs (190.8), the economists cast a weather eye on the farmers, and said they thought the index would go up less over the next year than in any year since Korea.

What the economists figured was this: U. S. farmers expect to raise more food this year than in any other (except 1948 and 1949). The drought will do little real damage to food crops; beef herds are increasing and there'll be plenty of meat available.

Thus, with luck—no war or bad drought—the C of L index shouldn't go up more than 1.5-2% between mid 1952 and mid 1953 (compared to 11% in the 4 months after Korea). Such a relatively small rise should take a lot of the pressure off wages, they think.

- **We're not happy**—Industry leaders on NPA's Construction Industry Advisory Committee are making no secret of the fact that they're unhappy with NPA's treatment of them.

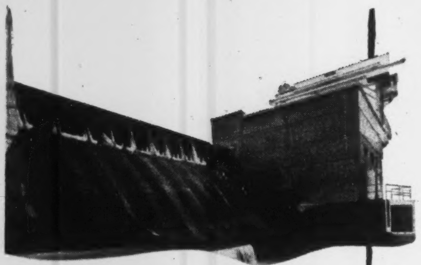
Here is the contractors' complaint:

In an effort to arrive at a better working relationship, CIAC appointed a six-man task group May 28, to act for the whole committee and recommend steps for liberalizing controls.

But the task group members insist they ran into a blank wall every time they showed up in Washington with suggestions. Their impression is that all NPA wants is a group to meet in Washington and rubber-stamp decisions already made—by NPA. Reaction has been grumbling resistance to NPA determinations.

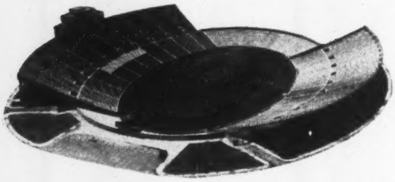
Paradoxically, that reaction is having the effect that all the recommendations and studies apparently couldn't get: NPA officials, backed into a corner by the builders' tactics (and pointed comments), got the word around that they were abandoning their plan to keep controls tightly in place until April 1, 1953.

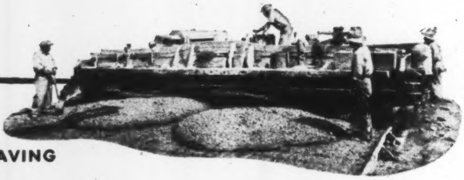
The word now is that controls will be relaxed pretty thoroughly by January 1. And they'll be completely off the books by April 1.



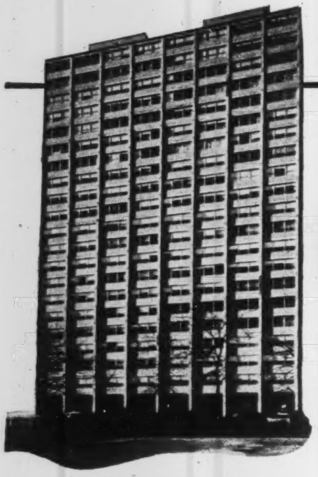
MASS

STRUCTURAL





PAVING



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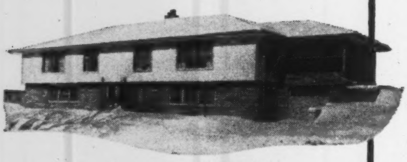

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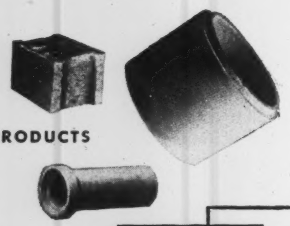

PRODUCTS

WHATEVER THE JOB...

Better concrete at no extra cost made with DURAPLASTIC*

WHEN YOU FIND that one cement makes better concrete for everything from a modern superhighway to a drain tile, you can readily understand the growing trend to *specify* it. Atlas Duraplastic makes concrete more durable and improves surface appearance as well. And there are mighty good reasons why this is so.

Duraplastic is the original air-entraining portland cement. It requires less mixing water for a given slump. Too, it minimizes water gain and segregation. This gives increased resistance to effects of freezing-thawing weather, and in paving helps avert the scaling action of de-icing salts.

You'll especially like the on-the-job advantages of a Duraplastic mix. Construction men find the greater plasticity aids proper placement. Highway builders have learned that less mixing water and less bleeding permit finishing closer to the paver, earlier protection for curing. Products manufacturers report less breakage of green products.

You can have these advantages simply by specifying Atlas Duraplastic. It costs *not one penny more than regular cement.* No extra bother . . . just ordinary good care and procedure. Complies fully with ASTM and Federal Specifications. For more information, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

ATLAS® DURAPLASTIC

AIR-ENTRAINING PORTLAND CEMENT

A UNIVERSAL ATLAS PRODUCT

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Makes Better Concrete at No Extra Cost

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*

WEIGHS CHARGES—Army Secretary Pace, returning from an overseas inspection trip, is considering charges of "Waste and extravagance" in construction of North African air bases contained in the Senate Preparedness Subcommittee report.

PROBE TARGET—Target of the report is Lt. Gen. Lewis A. Pick, who has filed a reply to the charges. The African bases, says Pick are "one of the most difficult construction projects with which I have been confronted as Chief of Engineers."

Moroccan base probe seen misfiring

By Bill Kearns
Washington Staff

Take the politics, headline hunting, and service bickering out of the Moroccan air base charges and it boils down to this:

- Construction of the five air bases in Morocco will be costly and not up to standards established in the U.S. for air bases.
- But few overseas bases can come up to the quality of workmanship that you can get in the states. Conditions are extremely difficult and somebody always wants to speed construction schedules.

That's what happened in French Morocco.

The Air Force assigned top priority to the construction program—wanted the bases serviceable within six months. The resident engineer cut another two weeks off construction time to make the first operational date coincide with Bastille Day.

On the surface, the Bastille Day date sounds like an amateurish attempt at publicity. But, with French officials dragging their feet at every turn on issues that didn't come up during Paris talks, the recognition of Bastille Day had its merits.

• Shortcomings exaggerated—Senator Lyndon Johnson's committee put Chief of Engineers Lieut. Gen. Lewis A. Pick on the carpet for what Johnson called failure to give full and frank testimony. Johnson's impression was that Pick was covering up blunders made by the district engineer, Col. George T. Derby. Pick testified that the district engineer—Derby—would not have approved waiver of specifications, at least Pick didn't think so.

Atlas Construction Company officials had a different version. They say that specs were ignored on the orders of the district engineer (ENR April 3, p. 23).

Regardless of who ordered the set-aside of specifications, you get the idea from the Johnson report that the two completed bases at Sidi Slimane and Nouasseur only about a year old, are crumbling in the African dust. Actually conditions are far from being that bad.

Real story of what's wrong with construction is simply this: Fills and bases for runways and taxistrips were hurriedly put down. The asphalt pavement, instead of being the required four-inch thickness, is only three inches deep. Result is that there's been a heaving of runways in some spots, and a rutting of taxi-strips and hard stands in other areas. In addition, one runway was leveled through excessive use of asphalt surfacing at one end.

At times during the last year, Corps of Engineers inspectors claimed inadequate supervision of the contract. That resulted in a too large work force, loafing on the job, disregard of working hours, poor time-keeping practices, and inadequate property accountability. However, these conditions were cleared up by January of this year.

Actually, all of these conditions are about par and maybe better for the course on a multi-million "crash" construction job. That's what General Pick is now saying. And he adds: "During my recent (three weeks ago) visit, I found the work progressing at a highly satisfactory rate. The jobs are well organized and superior work is being accomplished. My determinations were concurred in by the local Air Force commanders."

The Army says that the Air Force issued a revocation of its "urgent" program last January. That leads a lot of Army officials to ask if the urgent program was necessary in the first place.

• Cost justified—Pick's report to Army Secretary Pace, released last week, estimated that the cost of repairing failing pavement and taxistrips would be $426,103 at the Nouasseur site and $734,537 at the Sidi Slimane base. Even with this additional cost, the total cost of the two facilities is still within the allowed authorization.

Senator Johnson's report on the Moroccan base construction practically ordered the Secretary of the Army to relieve General Pick of his post. According to the Johnson committee, Pick didn't display the frankness which the public demands of its officials. But the Johnson suggestions are largely academic at this date. General Pick will reach the statutory retirement age of 62 in November. He will not be replaced before his retirement, announced for October.

One thing that the Johnson committee seemed to overlook was the mulish attitude of French officials. Two years after original talks began with the French and it was agreed to build five bases in Morocco, we have still to come to terms with the French on the last two sites.

And, in addition, the French—even though we will eventually give them the bases outright—attempted to collect a 12.5% import tax on all construction materials. They have already collected close to a half-million in taxes on petroleum and lubricant products that we have brought in. They also want us to pay for the real estate which goes back to them when our troops withdraw from Morocco.

• Atlas scores report—Answering a request of ENGINEERING NEWS-RECORD for a statement regarding the report of the Senate Preparedness Subcommittee J. B. Bonny, chairman of the operating committee of Atlas Constructors, said:

"I have seen only excerpts of the reports of the subcommittee which were printed in the daily newspapers. These included allegations of waste and deficiencies, most of which were conclusively disproved in our testimony before the subcommittee last May and which were more fully gone into before the House Appropriations Subcommittee subsequent to our one day appearance before the Senate subcommittee.

"The newspapers report a statement by the subcommittee, as evidence of waste, that 28 Arab workmen were discovered loafing and sleeping on the job during an entire shift. Assuming that this was true, the combined pay of the 28 Arabs for the period was equivalent to about $14. This might have been avoided by hiring one American to watch the natives, but his pay for the same period of time would have exceeded that amount.

"Further, the subcommittee, seems to have soared into the stratosphere to predict total costs for these bases, and states that the subcommittee has been unable to arrive at an informed conclusion as to what will be the ultimate cost of the project.

"Within the past 60 days Atlas Constructors has reported to the Corps of Engineers that, based on the original requirements set up by the Air Force, our estimate of the cost for the completion of the five air bases will not exceed $300 million, the original estimate.

"Possibly Chairman Lyndon Johnson and members of the subcommittee have access to information unavailable to us regarding the extent of facilities to be constructed in North Africa. Otherwise, we cannot account for the enormously inflated figures.

"As of today, the proposed bases at Boulhaut and Safi (El Djema Sahim) have not yet been released to the contractor for construction. Our understanding is that the French protectorate government has not yet provided the necessary rights of way for these bases. Atlas Constructors has no connection with these arrangements."

Comptroller warns contractors: Beware U.S. overcommitments

A storm signal for contractors who do business with the federal government went up last week from the office of Comptroller General Lindsay Warren, the watchdog of congressional spending.

It was in answer to a request from the House Interior Committee which wanted to know if the Bureau of Reclamation had broken any federal law in overcommitting its authorization for the Eklutna hydroelectric project near Anchorage, Alaska.

Warren's opinion that it had (ENR Aug. 28, p. 19) means that the General Accounting Office will not okay payments to contractors for work on federal projects that exceed the congressional authorization. The opinion was based on an interpretation of Section 3732, revised statutes, which provides:

"No contract or purchase on behalf of the United States shall be made, unless the same as is authorized by law or is under an appropriation adequate to its fulfillment . . ."

In addition to Reclamation projects, this would apply to construction undertaken by the Corps of Engineers, either military overseas bases or domestic flood-control projects; to atomic energy projects; or on any federal construction where the congressional committee wants to put limitations on the amount of the authorization.

Under such a limitation, a contractor could be taken into court by the General Accounting Office to recover money paid him by the disbursing officer for the contracting agency. Although few, if any, may ever find themselves in court as a result of such a situation, contractors still would do well to check the legislative status of a project before accepting a contract for work on it.

• Danger signal—Any limitation on funds authorized for the project should be interpreted as a red light. If there is bad blood between the committee and the agency, there may be a long wait before adequate authorization is forthcoming. Meanwhile, getting caught in the crossfire between feuding committees and agencies could prove costly.

Behind the request for the opinion is the growing desire of Congress to exert more control over federal spending. Until this past session of Congress, most authorizing legislation was open-ended—that is, it authorized money for projects for as long and as much as the appropriation committees could be persuaded to go. But this year both House Interior and Public Works Committees put spending limitations on projects.

In the case of Eklutna, the Interior Committee put a limitation of $20,365,000. The overcommitment of $3,257,000 came to light last spring when the Bureau of Reclamation sought to have the authorization raised to $35 million.

• Reaction—Reclamation Commissioner Michael Strauss attributed the request for more funds to increased materials costs and to high-priced Alaskan labor. The four-mile tunnel to channel water from Eklutna Lake to the power plant will cost $17.3 million.

Notice to proceed on construction of the power plant has been delayed, pending additional authorization from Congress. This contract for $2,579,607 was awarded to Rue Contracting Co., of Fargo, N. D. Five other contracts, also in excess of the authorization limitation, have been let and work is proceeding on them. One is for construction of a $434,000 transmission line from Eklutna to Anchorage, awarded to Wiggins Construction Co. The remaining four, totaling less than $600,000, are for materials.

There is a difference in the limitations placed on Corps of Engineer projects by the House Public Works Committee. Instead of ceilings on specific projects like Eklutna, the committe placed limitations on area projects. On Missouri River Basin flood-control projects, for instance, a total of $616 million has been authorized, while estimate for construction work already begun is more than a billion dollars.

LINE OF MORRISON-KNUDSEN earth-moving machines gnaw cut along mountainside for temporary by-pass around Tunnel 5 in double-barreled operation. Earth from cut was pushed into Clear Creek Canyon to serve as fill.

M-K moves mountains—fast

When the first freight since the July 21 earthquake starting snaking its way down the mountainside and through the tunnels that lie between Bakersfield and Tehachapi, Calif., in the early dawn of Aug. 15, one of the biggest and fastest emergency earthmoving jobs in the West was finished.

More than 1000 men and 100 pieces of heavy equipment had been moved in to work on Southern Pacific's crushed tunnels and twisted tracks—damage that may run to $2 million.

Between Bakersfield (el. 414) and Tehachapi (el. 3967), a 48-mi run, SP had 15 tunnels before the quake. After it was over, they had 13 and part of another. In the major damage area, the 11 mi between Caliente and Rowen, four tunnels were badly shattered, linings of four more were cracked.

Adding up its other losses, the railway found water tanks overturned, rails out of alignment, water pipes broken—a huge loss in time and money. Another loser was Sante Fe, which runs its trains over SP's lines crossing the Tehachapi Mountains.

To do the repair job, SP called in Morrison-Knudsen Co. They got on the site early July 22, bringing men from as far as Idaho and Oregon, as well as 80 tractors, 38 carrying scrapers, 2 draglines, trucks, tunnel muckers and maintenance equipment. SP brought in six extra track gangs and six B & B (bridge and building) gangs, who worked on water tanks and scaling. Santa Fe provided one extra track gang and three B & B gangs to aid in the work.

• Against time—Working under H. L. Leventon, M-K's project manager, within 36 hours the men had hacked out 3 mi of access roads from the highway and were cutting into mountain grades. Except for the battle against time, they found no major construction problems. Although 60,000 cu yds of earth were moved every day—a total of some 1¼ million cu yds, not a stick of dynamite was used. The earth was disintegrated granite with a low mica content, offering no compaction difficulties.

Roy W. Putnam, SP's engineer in charge of maintenance of ways and structures, described the tunnel damage. At Tunnel 3, the east 200 ft were in bad shape, with side walls pushed in and the arch broken in places, in spite of 23 in. reinforcing concrete and the usual reinforcing bars (1 x 2 ft spacing).

The tunnel had been raised up bodily. One rail was found under the wall of the tunnel, yet neither the wall nor the rail was broken. Since the east end of the bore was beyond repair, its concrete shell was pounded into rubble with 3-ton steel balls on draglines. It was daylighted for 206 ft, leaving a 494-ft tunnel. Crews dug away 160 ft of earth on top.

Tunnel 4, originally 300 ft east of No. 3, is now 8 ft closer. The valley between the two was buckled by the quake and the tracks accordioned. In No. 4, beyond repair, the shock raised the track 6 ft off the ground, and an earthquake crack ran on top of the tunnel. Crews left the old tunnel in place and laid track outside of it—a job that required a maximum 192-ft cut on the upper slopes.

• More damage—Track between Tunnels 4 and 5 were covered with slides in several places. When crews reached 1170 ft Tunnel 5, they found the west portal broken up and for 600 ft the walls and arches were damaged to varying degrees, requiring chipping, gunniting, and strengthening. 370 ft further the tunnel was plugged entirely, in what later proved to be two plugs, with a 200-ft opening between. The concrete in this opening was also damaged beyond repair. The east 200 ft is slightly damaged.

After working on No. 5 for 10 days, SP decided it would take an excessive amount of time to rebuild it where it is plugged and between. So service could be resumed quickly, a shoo-fly was laid on the hillside. Here, in 150 hours, M-K hauled 250,000 cu yds of earth to make two giant cuts, with a fill between. The fill was in a gulch, 135 ft deep, 460 ft across at the bottom and 50 ft across at the top. Before the fill could be made, a 72-in. pipe, 480 ft long, was laid at the bottom to provide drainage for a spring that appeared three days after the quake. The shoo-fly is 4200 ft long, 690 ft shorter than the original line through Tunnel 5. "We went around on the inside," says Engineer Putnam. It's a 2.37% grade, with a maximum 15 deg. curve.

Tunnel 6 was permanently daylighted. The concrete was taken out and the track relaid.

• **Track laid**—Putnam figures SP had to lay about 1¾ mi of track. Long tangents of track had to be resurfaced because small irregularities cropped up as the roadbed settled. One fill, by Tunnel 1, jumped out entirely, leaving the track dangling in mid-air. All SP's rails were heavy, 132 lb per yd.

On places along the entire line between Bakersfield and Tehachapi, especially on the high fills, the earth beside the tracks, from the ballast line on, was shaken down a few inches to several feet. Apparently ground directly under the tracks had been compacted by the weight of trains, while that outside was loose and gave way during the earthquakes.

Rocks, some of them the size of cars, had to be removed from the tracks. Before traffic was started over the line, all bluffs were scaled to prevent further rock slides, and many benching cuts were made. Major repairs are now complete, except for the rebuilding of Tunnel 5, which will be in use before winter.

Faulty sewer construction brings two suspensions

An engineering supervisor and a sewer inspector were suspended last week in Queens Borough, New York, after disclosures of shoddy construction in one segment of a $9-million sewerage network. A broad investigation into construction of the entire system has been indicated.

Following complaints from residents in one area, a two-mile stretch of pipeline was opened at several places. Pipes were reported missing, connections unsealed or stuffed with newspapers and rags, and other deficiencies found. Contractor for the job was Victor Clemente of New York.

Borough President James A. Lundy suspended Inspector John A. Neary and Supervisor Gerard J. Brinkman pending preparation and trial of charges.

Rear Admiral Joseph F. Jelley expects to put $755 million under contract.

Navy building to hit new peak

Contract awards and cash expenditures for Navy public works in the current year will reach the highest level since World War II. The Bureau of Yards and Docks plans big increases over last year's totals for both spending and awards.

By next June 30, the bureau proposes to have underway all Navy projects for which money has been appropriated. To reach that target, Rear Adm. Joseph F. Jelley, Chief of the Bureau, and his staff, expect to put some $755 million of additional work under contract during the year.

In the fiscal year that ended last June 30 the bureau made contract awards totaling $483 million. New Navy public works contracts accounted for about $340 million of that total. The rest consisted of obligations undertaken in other ways—work for other military services, additions to going projects, and the like.

Navy public works expenditures for the current year run up to $766 million. Last year, the Navy spent $325 million on its projects.

• **Full speed ahead**—Projected figures for both contract awards and construction spending indicate the accelerating tempo of the Navy public works program. Faster operation has become possible as the program advanced and the bureau built up its staff to handle more work.

Since 1948, Navy public works have received a total of $1.8 billion in appropriations. The bulk of that money came in three big slugs during the last twenty months—$303 million in January 1951, $800 million in November of last year and $363 million a month ago, in July 1952.

Appropriations are just the starting point toward getting the work under contract. Money for each project first has to be released by the Bureau of the Budget to the Defense Department. When the release comes to the bureau, that agency has to negotiate an architect-engineer contract for design of the project. With the design completed, the bureau next must invite bids. The design and bidding steps usually take six to eight months before a contract can be awarded.

Some $700 million of unobligated money remains to be put under contract in the remaining ten months of the current fiscal year. It is estimated that not more than $50 million has been obligated since June 30.

First to be ready, of course, will be the jobs that Congress voted money for in the past. These projects are nearest the bidding stage. They

Plans accelerated program . . .

. . . to meet defense challenge.

amount in all to about $400 million, with some $225 million scheduled for starting before January.

• The line-up—Admiral Jelley and his men aim to get the bulk of these projects under way by Nov. 30. Except for a few jobs that have not been cleared by the Budget Bureau, the projects are about ready to go. Among the delayed jobs are some aviation facilities and three hospitals, two at Great Lakes, Ill., and one at Long Beach, Calif. A fourth, an $8-million hospital at San Diego, Calif., could get started by December.

Here are some of the larger jobs from the fiscal 1952 program on which bids may be asked within the next few months:

- In the $5-million-to-$5½ million class: (1) Naval Air Station, Oceana, Va., garage, barracks, utilities and roads; (2) Yorktown, Va., fuel oil storage facilities.
- Likely to cost about $4 million each: (1) Harpswell Neck, Me., bulk facilities for aviation and jet fuel storage; (2) Naval Amphibious Base, Little Creek, Va., dredging; (3) Norfolk, Va., communication facilities; (4) Great Lakes, Ill., electronics supply office building.
- Probable contract value about $3 million each: (1) NAS, Jacksonville, Fla., overhaul and repair building; (2) NAS, Whidbey Island, Wash., barracks and messing facilities.
- Projects with a potential contract valuation around $2.5 million: (1) Lake Denmark, N. J., rocket test facility; (2) Willow Grove, Pa., airfield pavement; (3) Cecil Field, Fla., barracks and messing facilities.
- Jobs worth about $2 million each: (1) Portsmouth, N. H., electrical test laboratory; (2) Atlantic City, N. J., airfield pavement; (3) Chase Field, Tex., airfield pavement; (4) Whidbey Island, Wash., barracks; (5) Kodiak, Alaska, heating and auxiliary power plant; (6) Barbers Point, Hawaii, mess hall and galley.

These projects, noted above are some of the larger jobs that will probably go out for bids before December. Following them in this fiscal year will come a hundred or more sizable projects that received money in the 1953 appropriation bill enacted last month.

• Further breakdown—The new appropriations supply $135 million for overseas construction and $226 million for work in the continental U. S. Biggest part of the overseas money is for aviation facilities ($84 million) and fleet facilities ($23 million). Most of this overseas work is classified and cannot be reported.

In the United States, $61 million of the new construction money goes to aviation facilities, $40 million to ordnance works, $25 million to Navy shipyards and more than $20 million each to Naval supply, service school, and Marine Corps facilities. The Bureau of Yards and Docks gets nearly $18 million of the new appropriation for U. S. facilities of its own.

All sizes of contracting firms, from the smallest to the largest, will be bidding on Navy jobs. Biggest portion of the money goes into large contracts, but there are thousands of small jobs to be awarded.

Last year's record of contract awards tells the story. In putting $483 million under contract during fiscal 1952, the bureau made 4,352 awards. Nearly 80% of that number, or 3,475 contracts were awarded for less than $50,000 each. Total value of these small contracts was about $50 million. At the other end of the scale, the bureau during the same year awarded 114 contracts of more than $1 million each. These 114 contracts have a total value of about $285 million.

• Big jobs—Major U. S. construction to be financed out of fiscal 1953 appropriations includes work at four Navy yards: about $3.5 million provided for three projects at Boston; $11 million for three jobs at Brooklyn; more than $4 million for three projects at Philadelphia, and $6 million for six at Charleston, S. C. The Norfolk Naval Base also received $3 million for three improvements.

Largest single appropriation for a Navy project in the U. S., set up $13.7 million to build Marine Corps depot and supply school facilities at New Albany, Ga. The bill also provided $9 million for storage and supply construction at Byron, Ga.

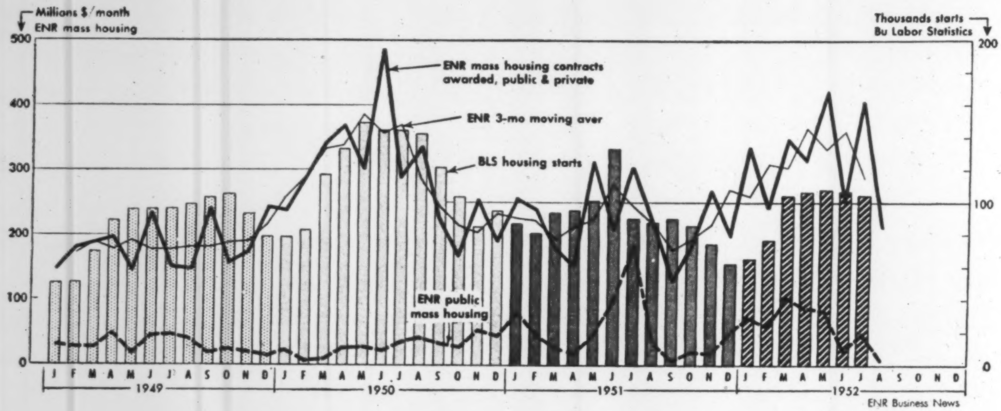
Large sums, from $4.6 to $7.7 million, were appropriated for magazines and storehouses at three ammunition depots—Hastings, Neb., McAlester, Okla., and Shumaker, Ark. About $7.5 million was supplied for three jobs at the Naval Amphibious Base, Little Creek, Va., and some $3 to $3.5 million for school and training facilities at each of three California locations: Monterey, Point Loma and San Diego.

For aviation facilities, the 1953 appropriation measure granted funds of $2 million to more than $4 million each for individual projects at Cherry Point, N. C.; Chincoteague, Va.; Glenview, Ill.; Jacksonville, Fla.; Lakehurst, N. J.; Miami, Fla.; Miramar, Calif.; New York, N. Y.; Lincoln, Neb.; Patuxent River, Md.; Pensacola, Fla.; Philadelphia, Pa.; Point Mugu, Calif., San Diego, Calif., and Trenton, N. J.

Camp Pendleton, California Marine Base, was given $4 million for expansion. More interesting, the large sum of $1 million was appropriated to cover design work, including architect-engineer contracts, on utilities for the permanent camp.

Two items of special interest stand out among the funds appropriated for yards and docks facilities. One of the two provides $4.5 million for a concrete floating drydock capable of docking ships of 4,000 tons displacement. The second furnishes $450,000 to build a laboratory building of prestressed concrete, instrumented for continuous study of stresses in the structure, at Port Hueneme, Calif. The Bureau of Yards and Docks also gets $2.4 million for a mobile Seabee camp at Davisville, R. I.

Projects summarized here out of the 1953 appropriation bill indicate only larger U. S. jobs. In all, there are well over 100 continental projects and more than fifty overseas projects for which the new money measure provided funds. The Bureau of Yards and Docks aims to get nearly all of these jobs started by June 30, 1953.



ENR Business News

South shows 8-month housing boom

- **Contracts up 200% over 1951**
- **Pace slackens in other areas**

For the first eight months of this year, the South has set a new record of private mass housing contracts, as reported by ENGINEERING NEWS-RECORD.

Contracts in the South for the first eight months of 1952 hit $485 million. That is 23% more than for the entire previous record year of 1950 and represents almost a 200% rise over the first eight months of 1951.

This boom put the South in second place with 24% of the nation's mass housing in 1952. Last year, the South accounted for only 14% of the total. In 1950, the South's share was 12%.

Southern states taking part in the upswing are: Virginia, with $117 million in private mass housing contract awards; Florida, with $79 million; South Carolina, with $73 million, most of which occurred early in the year; and Georgia, with $51 million.

Much of the housing in the South Carolina-Georgia area is due to the large Atomic Energy Commission installations under construction.

• Decline in August—Housing news was not all good news last month. Throughout the country, private mass housing went into the doldrums. Contract awards, as reported by ENGINEERING NEWS-RECORD, dropped to $206 million in August. It was the lowest monthly volume since February's $185 million and it was sharply under the $357 million registered in July.

But last month's $206 million was still well above the $190 million reported for August, 1951.

And, the overall picture for housing to date shows a total of $2,042.6 million in contracts for the first eight months of 1952, an increase of 53% over the comparable period last year.

However, the year to date is 17% under the volume for the same period in 1950, which was the previous record year.

• Middle Atlantic still leads—On a regional basis, the Middle Atlantic states ranked first again this year with $684 million in new housing contracts for the first eight months. This represented 33% of the U.S. total.

The 1952 volume for the first eight months was 39% ahead of last year in the Middle Atlantic states.

A major factor in this good showing was the large volume of housing contracts in New York, which ran up a total of $286 million, or 42% of the total for the Middle Atlantic region.

Other big states in the Middle Atlantic region were Pennsylvania, $165 million, and New Jersey, $94 million.

Housing volume in the Middle West was 22% ahead of last year, with $305 million in new contracts. But this region had a smaller share of the nation's total in 1952—only 15%—compared to 18% in 1951.

Michigan started off the year at a fast pace, but activity has slackened since. Total contract volume for private housing in 1952 in Michigan was $112 million. This was well above the $87 million reported for Illinois and the $75 million for Ohio.

Ohio, with this $75 million for eight months, has already passed its mark for all of last year when a total of $71 million in private mass housing contracts was reported.

• West of the Mississippi region gains—The states west of the Mississippi, excluding the Far West, stepped up their private mass housing in 1952, reporting a total of $382 million for the first eight months.

This represented a 45% gain over the comparable 1951 period.

Texas and Missouri are leading the way in this region. Contract volume in both states has already equaled or surpassed the marks set for all of 1951, although activity is still far under the record levels that were reached in 1950.

Texas had contracts aggregating $216 million in 1952, exactly matching the total for all of last year. Missouri racked up a total of $93 million to date. This is more than a 50% gain over the $59 million for all of 1951.

The Far West is the one area where contracts, thus far in 1952, are below 1951 levels.

Volume in this region amounted to $112 million for the first eight months, 22% less than the $144 million for the comparable period in 1951.

• The outlook—For the remainder of this year, the outlook for housing is hazy. ENR's contract award figures for August showed a sharp drop. But that does not mean that housing is going to die off. There are still good reasons to believe that private mass housing will continue at a high level of activity through this year. But how high that level will be depends on the future of Regulation X, the importance of "Fannie Mae's" new program, and availability of mortgage money.

One thing seems certain—the demand for new housing—and in many areas, the real need—seem to insure a strong market for this type of construction, at least, for some time to come.

Spillway walls anchored to chalk

Seeking a quick way to drill 1,000 belled-bottom holes in Fort Randall Dam's peculiar chalk formation, the contractor built the special rig shown above.

Holes will contain anchor bars that will tie concrete spillway-chute walls back to the chalk. Resulting lightweight construction is claimed by Army Engineers to save more than $1 million, compared to the cost of gravity or cantilever retaining walls.

Two cut-chalk faces, each 60x587 ft in area, will be covered by the tied-back walls. Anchorage holes are 22 to 32 ft deep. Spacing is 8 ft both ways. About 8 in. dia., the holes are belled out to 18 in. dia. at their bottoms. Bars are 2-in. square, with 4-in. washers welded to their ends. In place, they are grouted, to complete the anchorage. In tests bars have broken while their anchorage remained firm.

The drill rig was used for similar construction in the dam's outlet channel two years ago. It consists of an inclined triangular tower and a drill mount that rides up and down on a forward column of the tower. The tower is supported by a skid platform that also carries a compressor. A length of pipe standing in the tower acts as an auxiliary air receiver. Tower inclination corresponds with the cut-chalk slope of 4 on 1, and the drill mount is perpendicular to the face.

The rotary drill has a bit with hinged teeth. When hole-bottom is reached, drilling rotation speed is increased, then centrifugal action causes the hinged bit teeth to spread, gradually reaming out the bell.

The rig was designed by Oscar McCormick, superintendent on the $8.4 million stage II contract for Fort Randall Dam. Contractor is Johnson, Winston, Kiewit, Condon-Cunningham, a combine of Minneapolis and Omaha contractors. Owner is the U. S. Corps of Engineers, the contract being administered out of the Omaha District office. Col. H. S. Miller is district engineer.

DPA okays tax benefits

The Defense Production Administration approved 152 new rapid tax amortization certificates between Aug. 14 and Aug. 20. The new industrial expansion certificates amounted to $98.3 million.

The largest certificate in the new list was awarded to the United States Steel Corp., Gary, Ind., for the production of metallurgical coke. The certificate was for $14.2 million.

MEETINGS

APWA features technical sessions

Last week in Los Angeles the American Public Works Association held the biggest public works congress in its 58 year history. There were more exhibits than ever before—79 total exhibitors—and the registration was large—nearly 1,000. All that in spite of the fact that this was the first congress ever held in the Far West—many hundreds of miles from the center of population of the group.

Needless to say the delegates and their ladies were royally entertained by their southern California hosts. But beyond that there was a meaty technical program that included—strangely enough—only one pure speech. The rest of the program was made up of panel-type presentations and a session including 12 separate question box discussions.

The speech was made by Samuel B. Morris, general manager and chief engineer, Los Angeles Department of Water and Power. In it Mr. Morris, who served as a member of the recent President's Water Policy Commission, touched on a whole range of water development problems.

These included the rivalry between the Bureau of Reclamation and the Corps of Engineers, the Fallbrook water grab in California, and California's proposed Feather River project that he lauded as ranking in importance with other great water development projects. But, his main theme or plea was for a greater federal coordination of water resource development that will also recognize local and states' interest.

- **Special sessions**—One afternoon during the congress, 12 question box sessions were simultaneously operated. Each was staffed by three or four authorities on the subject.

Considerable interest was shown in these subjects: drainage, street maintenance, street construction, refuse collection and refuse disposal. Some of the other sessions devolved into a discussion between the authorities assigned and one or two others.

Symposiums or panel discussions were the order of the day at the other technical sessions.

For example, the congress started off with a session on "Action on the pollution abatement front." This included three short talks followed by questions from the moderator and the audience. At this session, moderator was A. M. Rawn, chief engineer and

APWA Congress . . .

general manager, county sanitation districts of Los Angeles County. Pollution control on federal, interstate, and state levels, respectively, were covered by Carl E. Schwob, chief, Division of Water Pollution Control, U. S. Public Health Service; Edward J. Cleary, executive director and chief engineer, Ohio River Valley Water Sanitation Commission; and Vinton W. Bacon, executive officer, California State Water Pollution Control Board.

Cleary also served as president of the association and presided at most sessions of the congress.

Schwob, whose agency has recently completed a nationwide survey of pollution abatement needs, said that studies showed the need for 10,000 new waste treatment plants, replacements, additions or enlargements. To meet those and future needs over the next decade, an estimated investment of $9 to $12 billion will be required. This will mean construction at three times the 1951 rate if we are to catch up.

• **Ohio problems**—Cleary reviewed the interstate compact under which his agency operates and accomplishment thereunder. He emphasized his commission's belief in a strong program of public education as a necessary means of accomplishing the pollution abatement objective.

Mr. Bacon, in comparing the law under which his agency operates with a model state law suggested by the Public Health Service, said the California law does not incorporate the permit system as suggested in the model. The California legislature has concluded, he said, that it is not compatible to specify water quality objectives and, at the same time, to dictate treatment plant design.

A second symposium with Charles B. Bennett, director, Los Angeles City Planning Department, as moderator considered "Subdivision controls."

This session was led off by Portland, Ore., city engineer L. G. Apperson who covered financing, that is, who pays for what. Apperson included a plea for adequate standards if good results are to be obtained.

As if in answer to this particular plea, Harry B. Shatto, public works director of Hayward, Calif., presented standards developed by a committee of the APWA East Bay Chapter. These standards cover completely streets and drainage, but do not include standards for water and domestic sewer connections. Several design charts are included because, according to Shatto, certain procedures cannot be specified without also including instructions as to how to apply the method. The symposium was closed by Tuscon, Ariz., planning director Andre M. Faure who discussed planning integration.

Edward J. Cleary presided at biggest APWA Congress.

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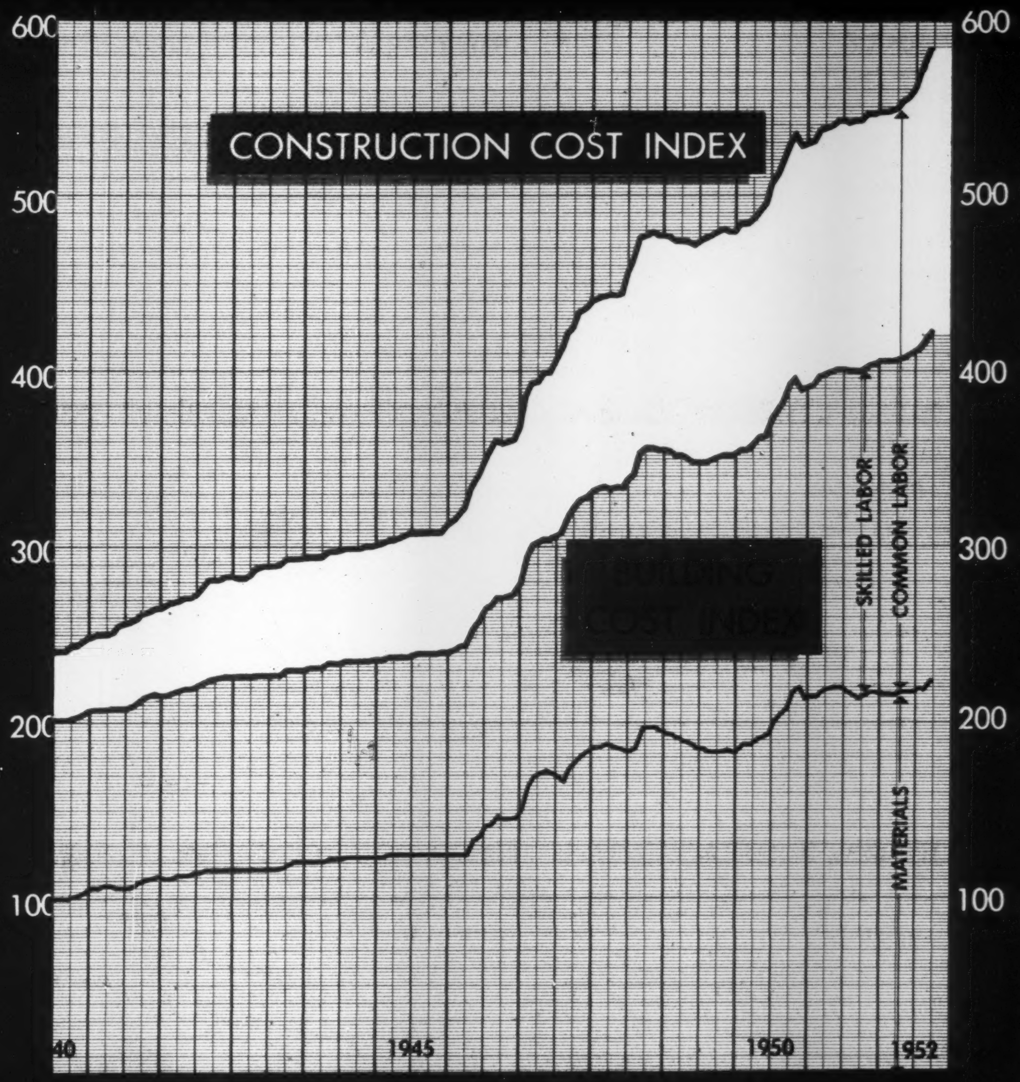

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APWA Congress . . .

general manager, county sanitation districts of Los Angeles County. Pollution control on federal, interstate, and state levels, respectively, were covered by Carl E. Schwob, chief, Division of Water Pollution Control, U. S. Public Health Service; Edward J. Cleary, executive director and chief engineer, Ohio River Valley Water Sanitation Commission; and Vinton W. Bacon, executive officer, California State Water Pollution Control Board.

Cleary also served as president of the association and presided at most sessions of the congress.

Schwob, whose agency has recently completed a nationwide survey of pollution abatement needs, said that studies showed the need for 10,000 new waste treatment plants, replacements, additions or enlargements. To meet those and future needs over the next decade, an estimated investment of $9 to $12 billion will be required. This will mean construction at three times the 1951 rate if we are to catch up.

• Ohio problems—Cleary reviewed the interstate compact under which his agency operates and accomplishment thereunder. He emphasized his commission's belief in a strong program of public education as a necessary means of accomplishing the pollution abatement objective.

Mr. Bacon, in comparing the law under which his agency operates with a model state law suggested by the Public Health Service, said the California law does not incorporate the permit system as suggested in the model. The California legislature has concluded, he said, that it is not compatible to specify water quality objectives and, at the same time, to dictate treatment plant design.

A second symposium with Charles B. Bennett, director, Los Angeles City Planning Department, as moderator considered "Subdivision controls."

This session was led off by Portland, Ore., city engineer L. G. Apperson who covered financing, that is, who pays for what. Apperson included a plea for adequate standards if good results are to be obtained.

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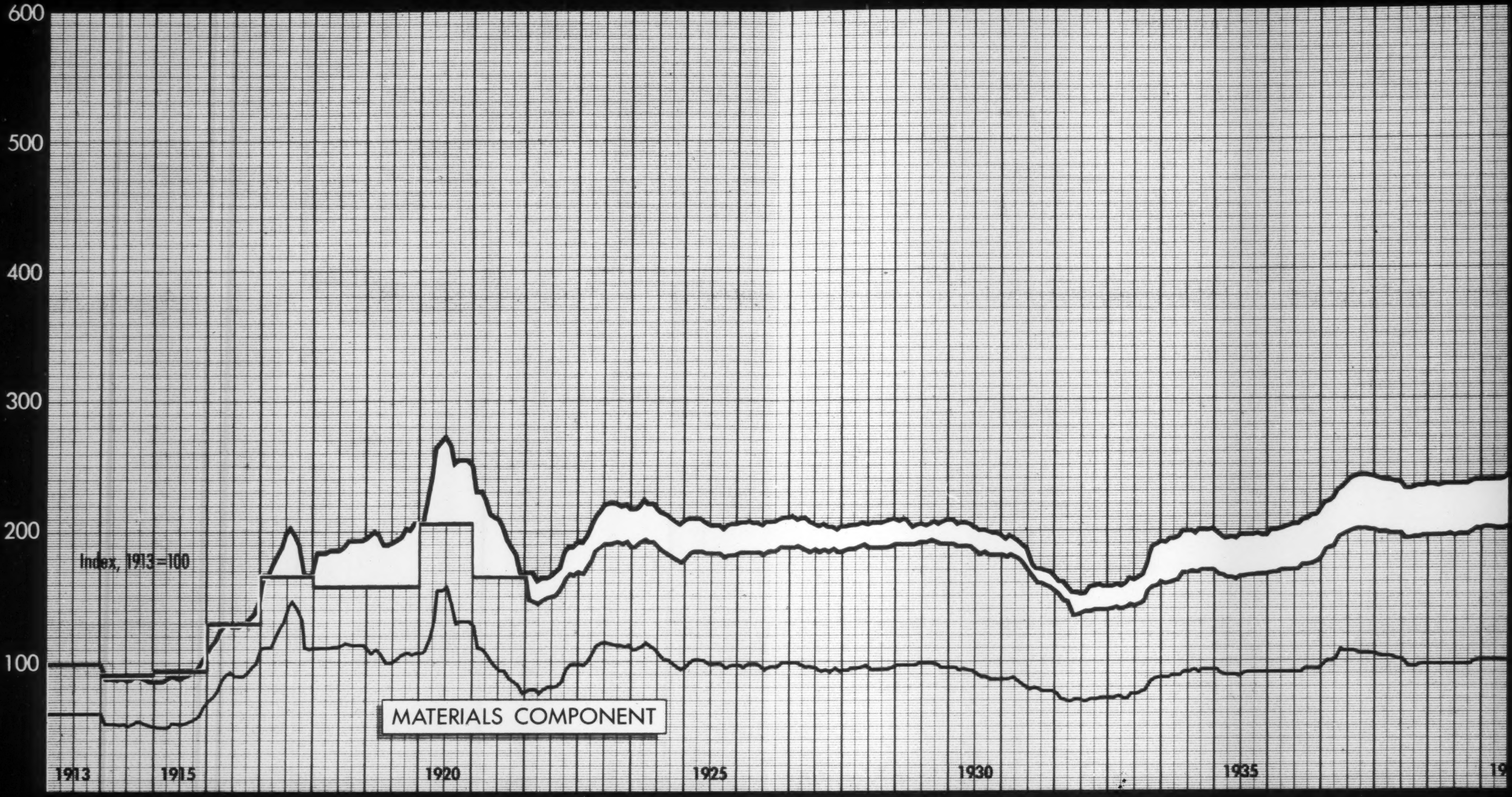

Construction and Building Cost Indexes

THE ENGINEERING NEWS-RECORD Construction Cost Index was established in 1921, based on price movements in structural steel, portland cement, lumber and common labor. The Building Cost Index was introduced in 1938 to measure also the effect of skilled wage trends on costs. It uses the same materials as those in the construction cost index but skilled labor, instead of common labor.

A few minor changes have been made in these indexes over the years necessitated by changed conditions in the market. These are recorded in full, together with a complete history of this development and use in ENR, September 1, 1949, page 398. New values are reported at the beginning of each month, based on 1913 = 100. These are weighted aggregative indexes, thus base years can be shifted at will.

ENR Construction and Building Cost Indexes reflect wage rate and material price trends. They do not adjust for labor or job efficiency, materials availability, competitive conditions, management, mechanization or other "intangibles" affecting construction costs.

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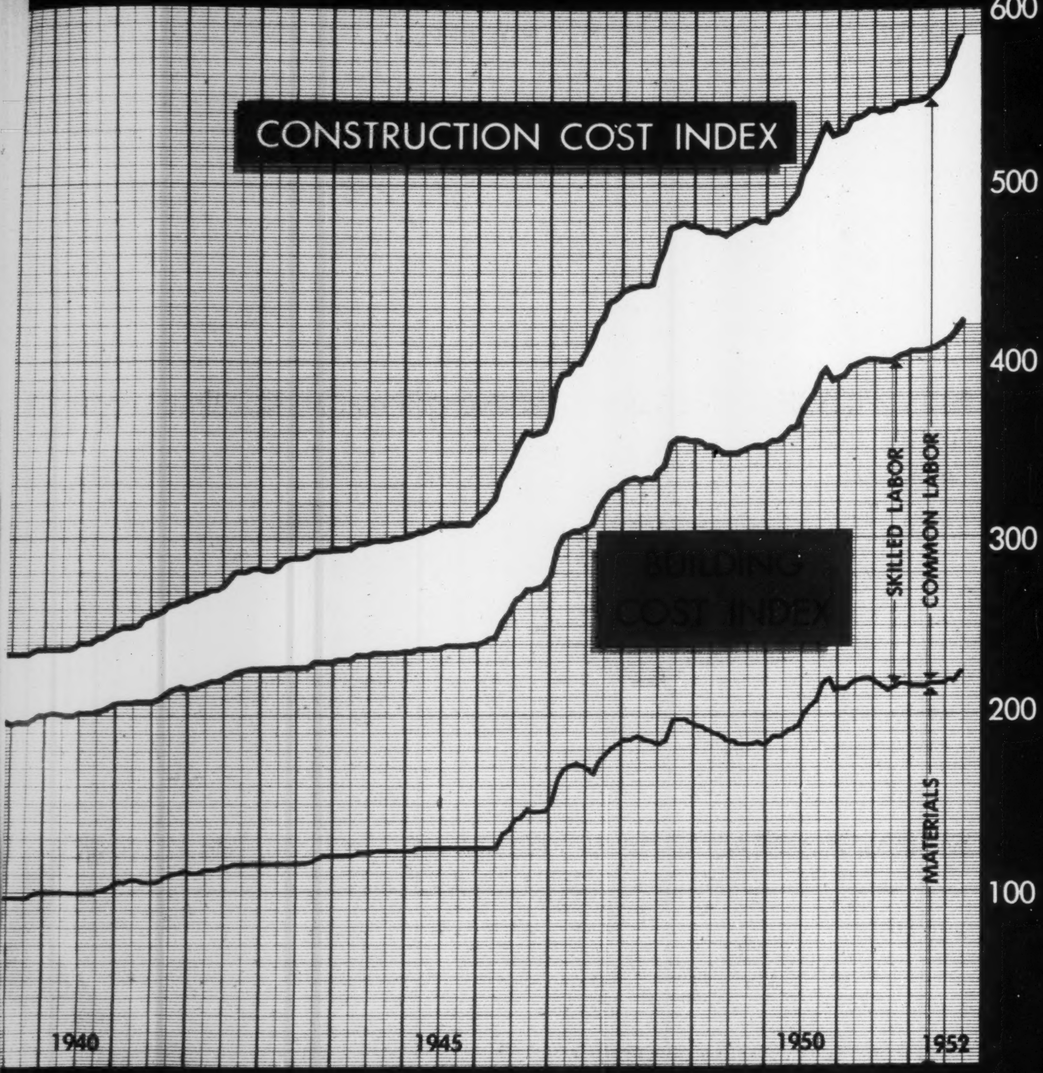

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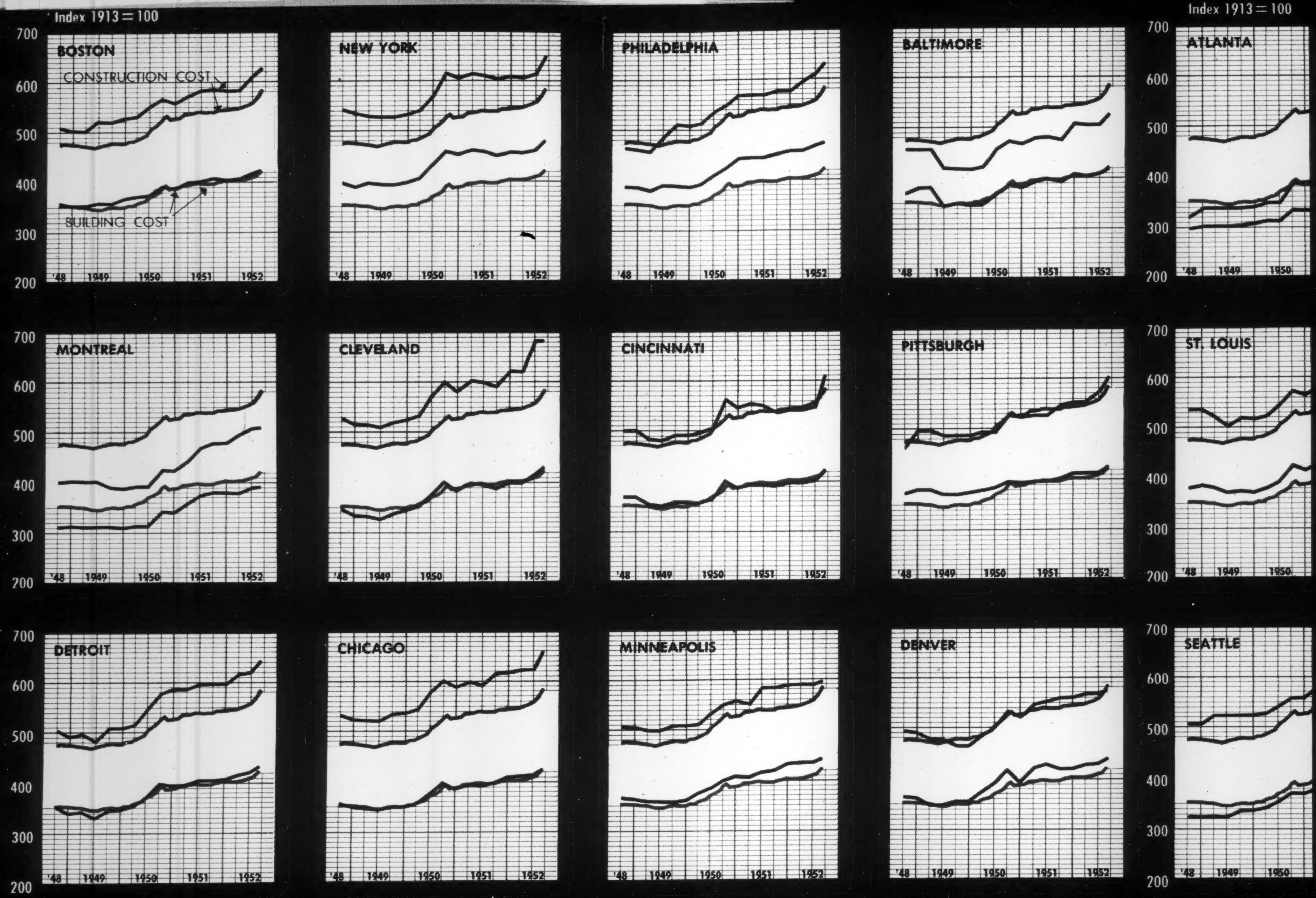

Components of Construction Cost Index and weighting in U. S. cities are: 25 cwt structural steel shapes, base mill price; 6 bbl portland cement, bulk, 1.088 Mfbm 2x4, S4S lumber, 200 hr common labor, at local prices. In Montreal, warehouse price of steel has to be used, so 15 cwt is weighting for steel. Price of Canadian steel is used prior to Oct. 1949 – the average of Canadian and U. S. steel prices is used after devaluation of Canadian dollar in Oct. 1949. Cement weighting is 10 bbl. Other elements are same as for U. S. cities. Components of Building Cost Index and weighting are same but 68.38 hr skilled labor is used instead of common labor.

These ENR Cost Indexes measure movements in the cost to contractors and engineers of construction materials and labor. They do not adjust for productivity. Where major differences between cities occur, the main reason is found usually in wage differentials. Lower wages are often accompanied by lower productivity, hence allowances for job productivity should be made in estimating end-product-price, or construction-selling-price trends based on the cost trends shown here.

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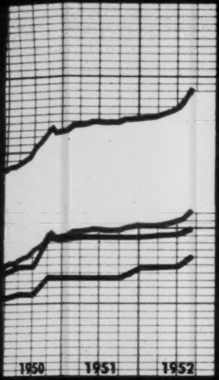

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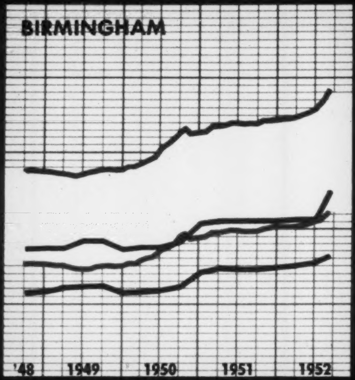

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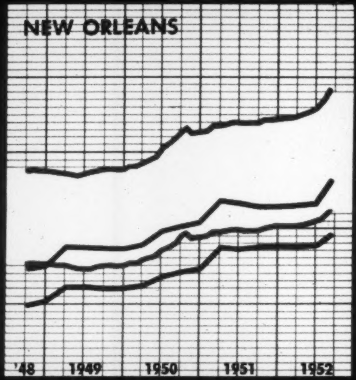

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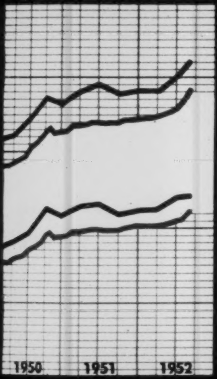

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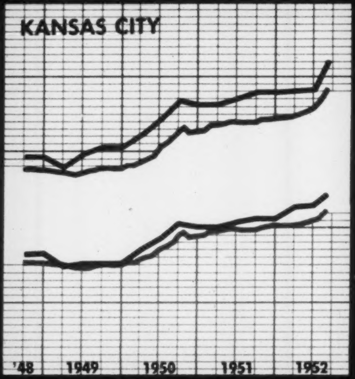

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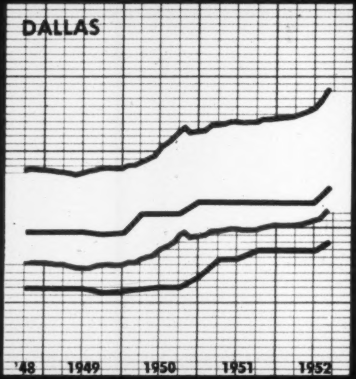

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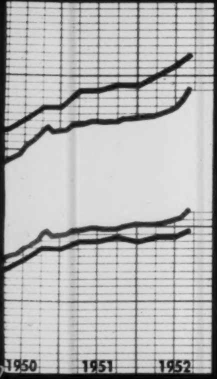

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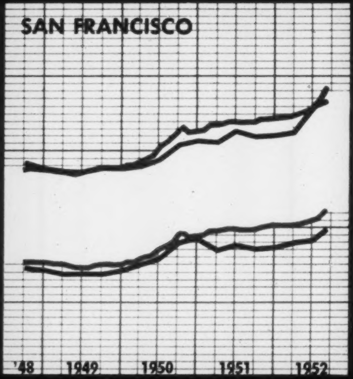

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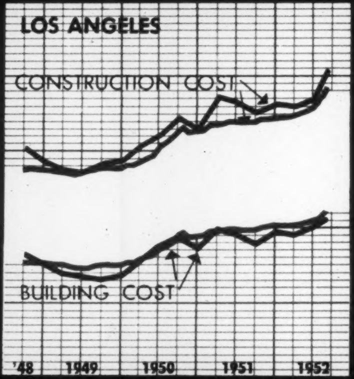

LOS ANGELES
CONSTRUCTION COST
BUILDING COST
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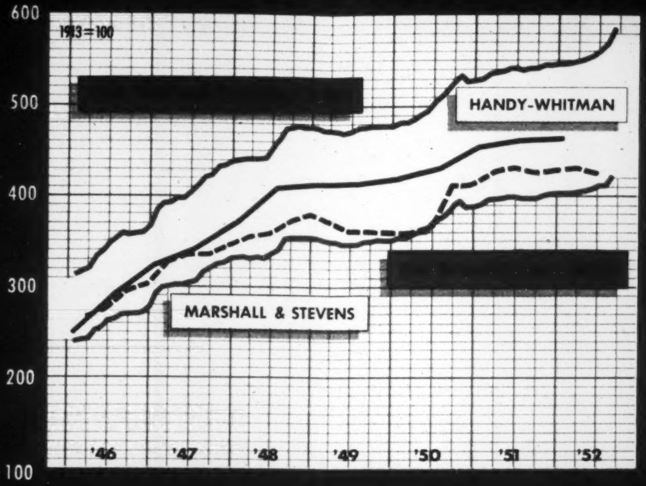
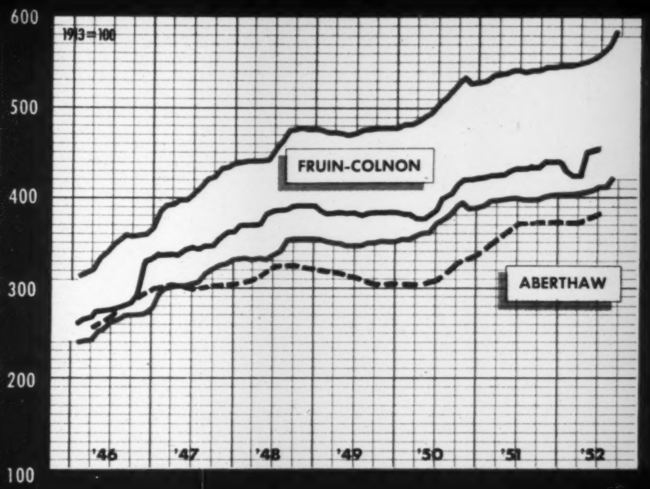
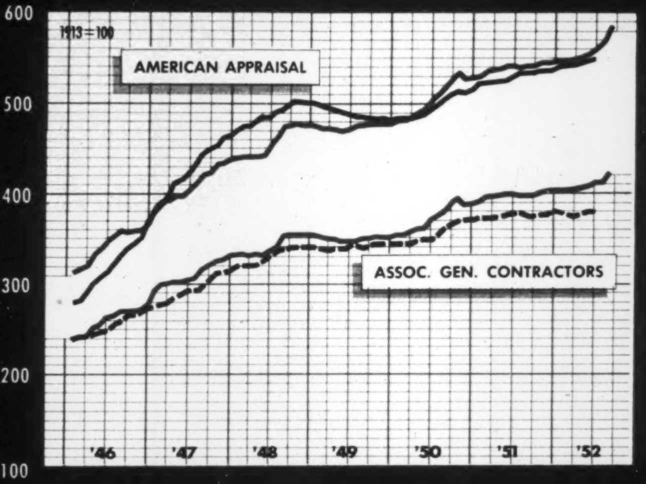
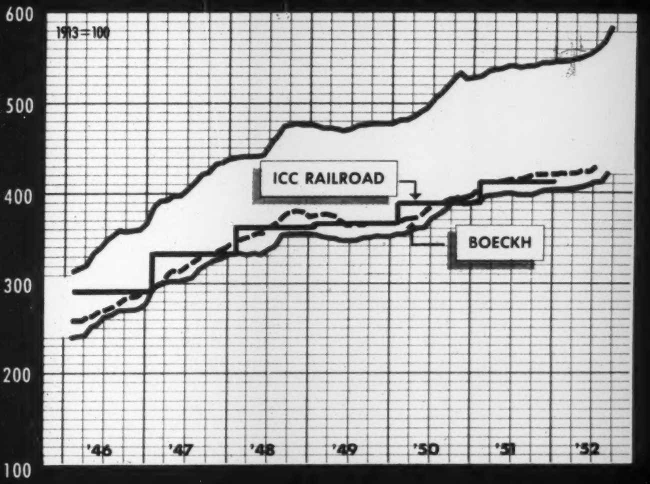
Each of the twelve building cost indexes, that are compared here with the Engineering News-Record Cost Indexes, is constructed by a different method. Each is computed by a different organization. And many different parts of the country are represented. The charts show their similarities and differences in measuring building cost and price trends. The definitions show their differences in makeup.









Aberthaw Co., Boston, Mass. – Since March 31, 1946, a composite of 36 major cost items in three multi-story and two one-story New England industrial buildings, including all mechanical trades. Repriced quarterly using actual and estimated labor and material costs. Base: 1914=100. (Prior to March 31, 1946, based on New England seven-story and basement, 62'4" x 202'4", reinforced concrete building built in 1914.)

American Appraisal Company, Milwaukee, Wis. – Based on detailed analysis of materials and labor required for four types of buildings (frame, brick, concrete and steel) in 30 representative cities. Corrects for labor productivity but assumes normal average conditions and does not recognize overtime or bonus payments to labor or premiums paid for materials in individual cases or under temporary abnormal conditions. Applies to construction only, does not include plumbing, heating, lighting, sprinklers, fixtures and decorations. 1913=100. For values in 22 cities see accompanying page.

Associated General Contractors of America (AGC), Washington, D. C. – Wages and materials for 12 cities combined in 40-60 ratio. Wages, prevailing rates for hod carriers and common labor. Materials, weighted: sand, gravel and crushed stone, 1; cement, 1; lumber, 1; hollow tile, ½; structural and reinforcing steel, ½. 1913=100.

Austin Co., Cleveland, Ohio. – Reprices typical one-story, steel frame, monitor type industrial building. Includes concrete foundations; brick curtain walls; continuous steel sash; concrete floor laid on ground; 2-in. wood roof deck on timber purlins covered with 4-ply waterproofing, monitor sash with mechanical operators, but no heating, lighting, plumbing, sprinkler or other services. Priced quarterly for central and eastern states. 1926=100.

E. H. Boeckh & Associates, Inc., Washington, D. C. – Current indexes are calculated upon an actual survey at source of local construction cost conditions. Material prices used are those paid by contractors to material dealers. Labor rates are current rates paid by contractors – certain corrections being made in certain areas for labor efficiency and labor shortage. Index includes construction overhead, sales taxes, compensation insurance and social security. Base 1926-'29=100. Special purpose indexes are reported monthly for ten classes of buildings in 47 cities.

Boeckh index shown in these charts is the national average for all five Boeckh commercial and factory building indexes, converted to 1913=100.

Fruin-Colnon Contracting Co., St. Louis, Mo. – Industrial plant of five buildings in St. Louis repriced monthly on basis of contractor's actual and estimated material and labor costs. 1913=100, 1926=100 both used as bases.

George A. Fuller Co., New York, N. Y. – Composite of 36 major cost elements, in three commercial type buildings, including mechanicals, elevators, wiring, heating and ventilating, repriced. 1913=100.

Marshall and Stevens, Inc. of Illinois, Chicago, Ill. – Indexes cover both comparative building costs, 1902 to date, and comparative equipment costs, 1913 to date. For industrial equipment costs see accompanying page. The building indexes are national averages with a system of modifiers to get regional and municipal values for each of four types of building: A. Fireproof, protected steel, B. Fireproof, reinforced concrete, C. Masonry buildings, D. Frame. They reflect normal costs in line with recognized or published prices of building materials, equipment and labor. Extraordinary or intangible conditions are not included. 1926=100.

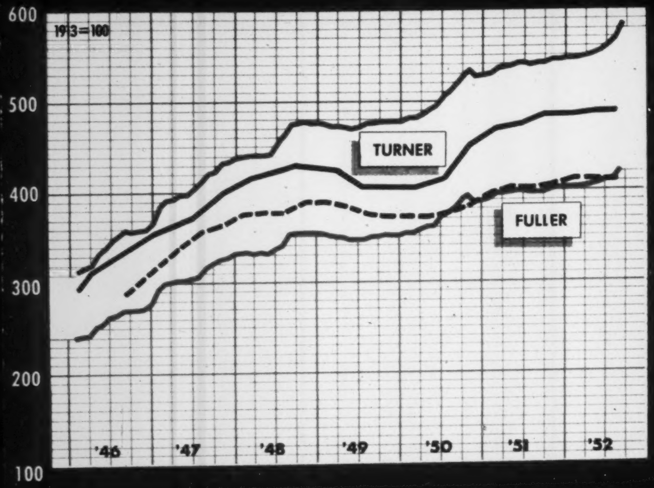
Smith Hinchman & Grylls Inc., Detroit, Mich. – Actual in-place costs, using building material costs, freight rates, skilled and unskilled labor rates and including labor efficiency and premiums, bidding competition, contractor profit margins and overhead. Figured with the contractor overhead are taxes, duration of projects, material expediting and labor procurement. Reported monthly. 1926=100.

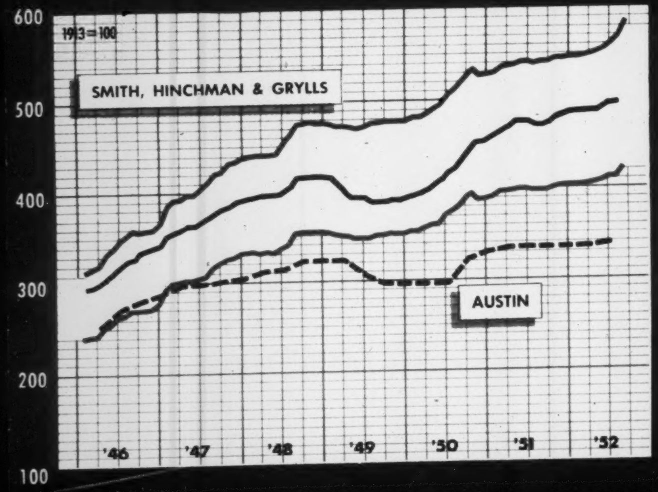
Turner Construction Co., New York, N. Y. – Eastern cities. Own cost experience on labor rates, material prices, productivity of labor, efficiency of plant and management, competitive conditions, forecast of price trends. 1913=100, 1926=100.

Railroad Construction Cost Indexes – Released annually, by Engineering Section, Bureau of Valuation, Interstate Commerce Commission, Washington, D. C., include items developed from analysis of major construction contracts over a period of years. 1910-1914=100. The series for stations and office buildings is used in the charts.

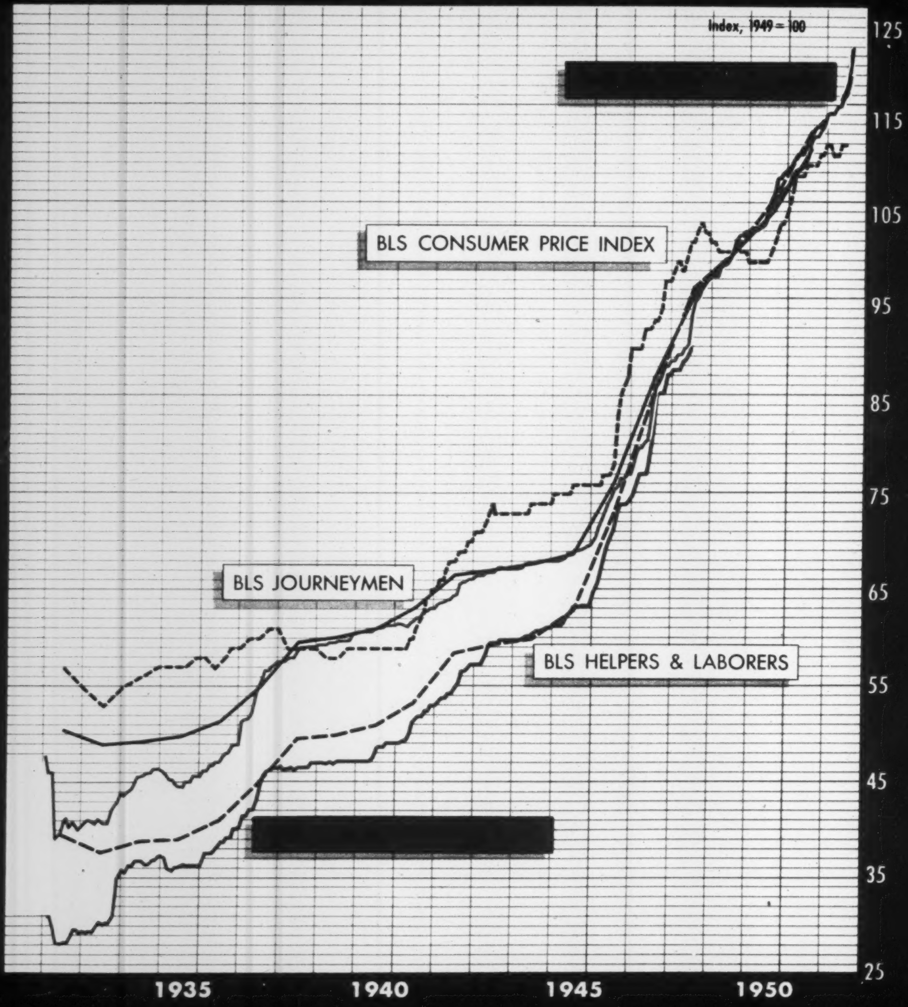
Handy-Whitman, Whitman, Requardt & Associates, Inc., Baltimore, Md. – Public utility cost indexes for 14 items of building construction, 17 items of gas plant construction and 64 items of electric light and power construction in six regions. Selected items are shown in a table on an accompanying page. 1911=100, 1911-14=100. The series used in these charts is for reinforced concrete building in the Pacific Division.

Indexes reported on 1926=100, and 1926-29=100 bases are converted to a 1913 base for plotting on these charts. Others are used on their original bases without conversion.





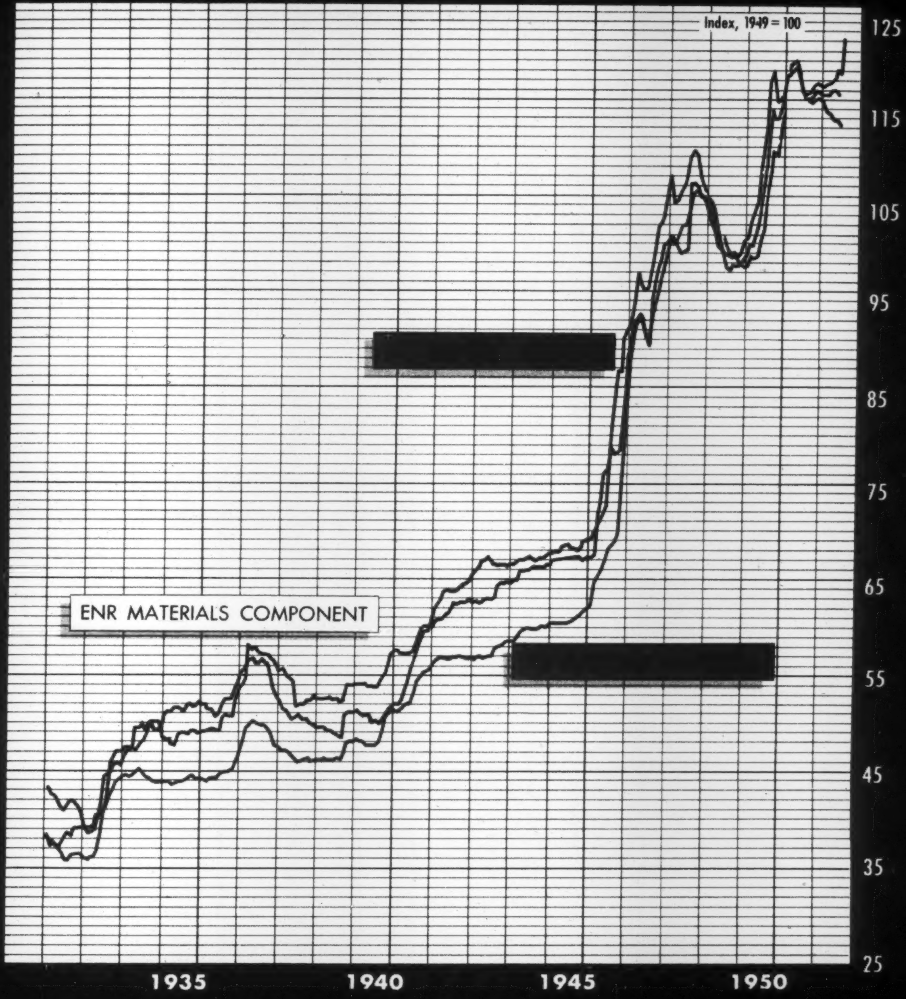
Building Cost Indexes Compared



MEN on construction work received their highest wages in 1952. To measure their gains ENR and BLS records of hourly wage rates are shown in index form, 1949 = 100. This base is used also for the Consumers Price Index. ENR skilled wages average three of the largest trades for 20 cities – carpenters, bricklayers, structural iron workers. The common labor average covers workers on both heavy construction and building. Both series are reported monthly and include straight hourly rates and fringe benefits such as payments by contractors into vacation, welfare, health or pension funds.

BLS index of wages paid journeymen, also helpers and laborers, represents average hourly union wage rates in the building trades, fringe benefits not included, reported annually as of July 1.

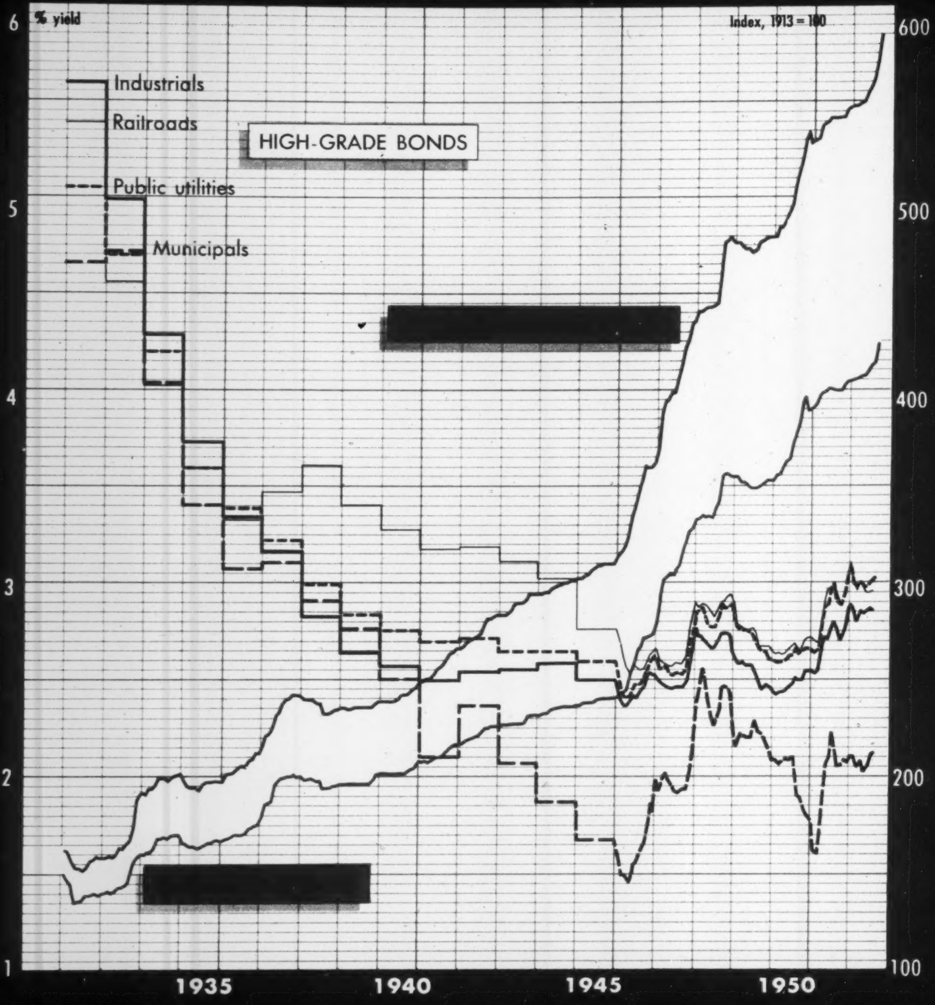
BLS Consumers Price Index shows trend in cost of living as measured by changes in retail prices paid by moderate-income families in large cities for goods, services and rents. The new, adjusted series is used here.



MATERIALS price movements are shown here by the materials component of the ENR cost indexes and by the BLS Wholesale or Primary Markets Price index. All are repriced monthly. The ENR materials component uses average prices of cement and lumber in 20 cities and of structural steel shapes at three mills, weighted and combined for the indexes, 25 cwt of steel, 6 bbl of cement, 1.088 Mftbm of 2x4 s4s lumber.

BLS Wholesale Price Index for building materials began a new series January 1952. Both are shown. The old series is official through December 1951 and ends then. The new series is official from January 1952 on. It uses 57 commodities in 7 groups selected from all commodities.

BLS Wholesale Price Index for all commodities includes building materials as well as foods, metals, machinery and other basic goods. The old series, official through December 1951, covers 900 items. The new series, official from January 1952 on, covers 2,000 items.



MONEY costs are above their lows but still reasonable. These are measured here by average yields on 15 high-grade municipal bonds and by the per cent yield of A1 plus grade industrial, public utility and railroad bonds as reported by Standard & Poor's.

Trends in the cost of Men, materials, and money

History and use of ENR cost indexes

The construction cost index was established in 1921, based on structural steel, portland cement, lumber and common labor. The building cost index was added in 1938 to measure the effect of skilled wage trends on costs. Both use the same materials component. Such minor changes as have been made are recorded in full in ENR, September 1, 1949, page 398.

Both indexes assume a hypothetical block of construction requiring 6 bbl of cement, 1.088 Mftbm of "2x4" lumber and 25 cwt of structural steel. The construction cost index uses 200 hr of common labor. The building cost index uses 68.38 hr of skilled labor. Both are reported monthly on a 20-cities average basis, both are available quarterly, since September, 1948, for each of the 20 cities for which ENR reports prices and wages, and for Montreal, Canada.

Both indexes measure trends in what construction men have to pay for labor and materials. They do not adjust for productivity of management or labor, for materials substitutions, for overtime, for mechanization, for competitive conditions. They are compared in these pages with contractor indexes and bid price indexes that do reflect these "intangibles."

ENR Cost Indexes

Engineering News-Record Cost Indexes

	Construction				Building			
Yr	'26=100	'39=100	'40=100	'49=100	'26=100	'39=100	'40=100	'49=100
'26..	100.0	88.3	85.9	.....	100.0	93.6	91.2	.....
'28..	99.4	87.8	85.4	.....	101.6	95.2	92.6	.....
'29..	99.5	87.9	85.5	.....	103.1	96.6	94.1	.....
'30..	97.5	86.1	83.8	.....	100.2	93.9	91.4	.....
'31..	87.1	77.0	74.9	.....	91.3	85.7	83.5	.....
'32..	75.4	66.6	64.8	.....	75.7	71.3	69.4	.....
'33..	81.8	72.2	70.3	.....	79.5	74.8	72.8	.....
'39..	113.2	100.0	97.3	.....	106.7	100.0	97.3	.....
'40..	116.3	102.7	100.0	.....	109.6	102.7	100.0	.....
'41..	124.0	109.4	106.5	.....	114.3	107.1	104.2	.....
'42..	132.8	117.3	114.1	.....	120.2	112.6	109.6	.....
'45..	147.9	130.6	127.2	.....	129.3	121.1	117.8	.....
'46..	166.3	146.9	143.0	.....	141.8	132.9	129.4	.....
'47..	198.6	175.4	170.8	.....	169.2	158.5	154.3	.....
'48..	221.5	195.6	190.4	.....	186.2	174.5	169.9	.....
'49..	229.3	202.5	197.1	100.0	190.2	178.2	173.4	100.0
'50..	244.7	216.2	210.4	106.8	202.8	190.0	185.0	106.7
'51..	260.6	230.1	224.0	113.6	216.5	202.9	197.5	113.9

Index base conversion table

To change base years for Engineering News-Record Construction and Building Cost Indexes, divide by following conversion factors:

To convert From Base 1913=100 to Base below:	Divide 1913=100 values for Construction Cost Index by	Divide 1913=100 values for Building Cost Index by
1949=100	4.7702	3.5179
1947–49	4.5033	3.3642
1940=100	2.4196	2.0281
1939=100	2.3551	1.9744
1926=100	2.0803	1.8499
1925–29=100	2.0695	1.8648
1929=100	2.0702	1.9086
1910–14=100	0.9380	0.9477
1924=100	2.1536	1.8578
1923–25=100	2.1204	1.8481
1914=100	0.8856	0.9191
1911=100	0.9343	0.9414

Engineering News-Record Cost Indexes—1913=100

CONSTRUCTION

	1926	1932	1939	1942	1945	1946	1947	1948	1949	1950	1951	1952
January	207.2	162.5	234.7	267.6	302.5	316.3	387.0	441.7	477.4	484.7	531.9	547.8
February	206.6	161.8	234.3	269.4	303.7	319.5	393.7	442.7	475.4	484.9	538.0	549.3
March	207.7	157.2	234.4	269.7	304.5	323.8	395.5	443.6	474.8	488.4	539.2	550.6
April	207.1	153.1	234.9	271.8	306.4	334.6	399.6	443.6	474.3	491.9	540.0	554.1
May	207.3	152.8	234.7	272.3	307.4	339.7	400.0	444.9	472.1	496.6	543.0	557.1
June	204.8	152.2	235.0	274.2	309.0	348.7	406.6	455.8	473.8	506.9	542.8	561.7
July	207.8	153.4	234.9	277.7	309.0	354.7	413.8	464.8	477.5	512.7	542.3	570.7
August	208.3	156.8	234.9	281.6	309.1	361.4	422.9	477.1	478.2	521.4	542.9	583.7
September	208.3	158.0	235.0	281.6	309.3	360.2	426.4	478.4	479.8	530.4	543.0	.....
October	209.8	159.2	236.9	282.4	309.3	360.9	434.6	480.2	480.5	534.4	546.5	.....
November	210.8	158.2	238.2	283.6	309.3	362.5	436.9	478.3	480.0	527.9	547.2	.....
December	210.8	158.5	238.2	283.7	313.5	369.3	441.1	477.7	480.3	528.7	547.7	.....
Average	**208.0**	**157.0**	**235.5**	**276.3**	**307.8**	**346.0**	**413.2**	**460.7**	**477.0**	**509.1**	**542.0**	.....

BUILDING

	1926	1932	1939	1942	1945	1946	1947	1948	1949	1950	1951	1592
January	182.3	150.6	196.2	217.1	236.5	242.2	294.6	333.6	354.9	356.2	393.0	405.8
February	183.7	147.2	196.2	218.4	237.7	243.9	301.6	335.5	352.9	356.5	398.2	406.2
March	184.3	145.9	196.5	218.9	237.9	245.4	303.3	334.2	352.5	360.0	399.3	407.4
April	184.1	135.7	196.5	219.6	238.5	254.4	305.2	334.6	351.4	362.8	400.1	407.9
May	183.6	136.4	196.6	220.1	238.5	258.1	304.6	333.9	348.9	364.3	401.1	410.3
June	181.8	137.6	196.4	221.2	239.4	265.3	307.4	339.3	349.3	373.4	400.8	412.5
July	184.3	139.5	196.8	223.5	239.6	267.3	308.9	342.4	349.5	377.7	400.3	414.5
August	185.1	139.4	196.5	225.4	239.9	272.3	317.8	355.5	350.9	383.1	400.2	422.4
September	185.1	139.6	196.6	225.5	240.1	272.4	322.6	356.7	352.0	392.8	400.3	.....
October	188.0	140.0	198.5	225.9	240.4	273.0	327.3	357.1	353.0	396.2	403.4	.....
November	188.0	139.5	201.2	226.6	240.6	274.0	329.2	355.9	352.9	388.9	404.5	.....
December	188.0	140.0	201.2	226.6	240.8	280.0	333.1	355.6	353.2	390.1	405.7	.....
Average	**184.9**	**140.9**	**197.4**	**222.4**	**239.1**	**262.4**	**313.0**	**344.5**	**351.8**	**375.2**	**400.6**	.....

ENR Cost Indexes, in 21 cities, 1913=100

CONSTRUCTION

	1948		1949				1950				1951				1952	
21 Cities	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June
Atlanta	325	345	345	345	345	345	354	354	394	390	395	395	395	395	395	397
Baltimore	462	462	462	445	424	424	427	462	479	474	486	488	482	513	510	511
Birmingham	378	379	379	389	389	377	381	381	388	413	416	416	416	416	417	417
Boston	513	508	507	526	525	532	536	556	570	563	576	586	590	588	590	614
Chicago	537	530	527	526	541	542	550	584	607	593	603	598	620	624	626	626
Cincinnati	505	505	490	487	496	496	502	510	568	553	559	556	543	548	547	553
Cleveland	535	523	520	514	525	530	537	578	605	587	607	605	597	626	625	685
Dallas	398	398	398	398	394	397	422	423	423	438	437	437	437	437	437	437
Denver	499	496	482	482	470	470	491	506	541	528	552	558	564	564	571	572
Detroit	511	500	501	489	514	515	521	555	583	592	592	602	601	601	621	625
Kansas City	500	500	484	501	511	511	528	551	571	570	570	575	586	586	586	588
Los Angeles	511	495	482	478	489	494	511	529	552	537	580	572	558	569	565	574
Minneapolis	512	510	504	504	512	512	516	538	555	562	557	587	587	592	593	593
New Orleans	350	354	379	379	379	379	383	402	408	412	441	439	434	435	435	437
New York	549	541	537	534	533	539	546	575	620	611	618	616	609	615	612	618
Philadelphia	470	467	462	492	517	515	518	541	556	575	575	575	582	582	601	616
Pittsburgh	470	502	502	492	492	492	497	499	532	529	531	531	551	557	557	577
St. Louis	542	542	527	508	524	522	529	552	579	569	585	597	584	587	587	608
San Francisco	590	484	478	478	483	483	486	495	513	519	518	533	525	527	532	565
Seattle	512	512	530	530	530	530	524	548	564	563	586	586	593	592	606	620
Montreal	406	408	407	408	396	394	397	397	428	427	445	473	484	484	500	510

Components of Construction Cost Index and weighting in U. S. cities are: 25 cwt structural steel shapes, base mill price; 6 bbl portland cement, bulk, 1,088 Mfbm 2x4,S4S lumber, 200 hr common labor, at local prices. In Montreal, warehouse price of steel has to be used, so 15 cwt is weighting for steel. Price of Canadian steel is used prior to Oct. 1949—and the average of Canadian and U. S. steel prices is used after devaluation of Canadian dollar in Oct. 1949. Cement weighting is 10 bbl. Other elements are same as for U. S. cities.

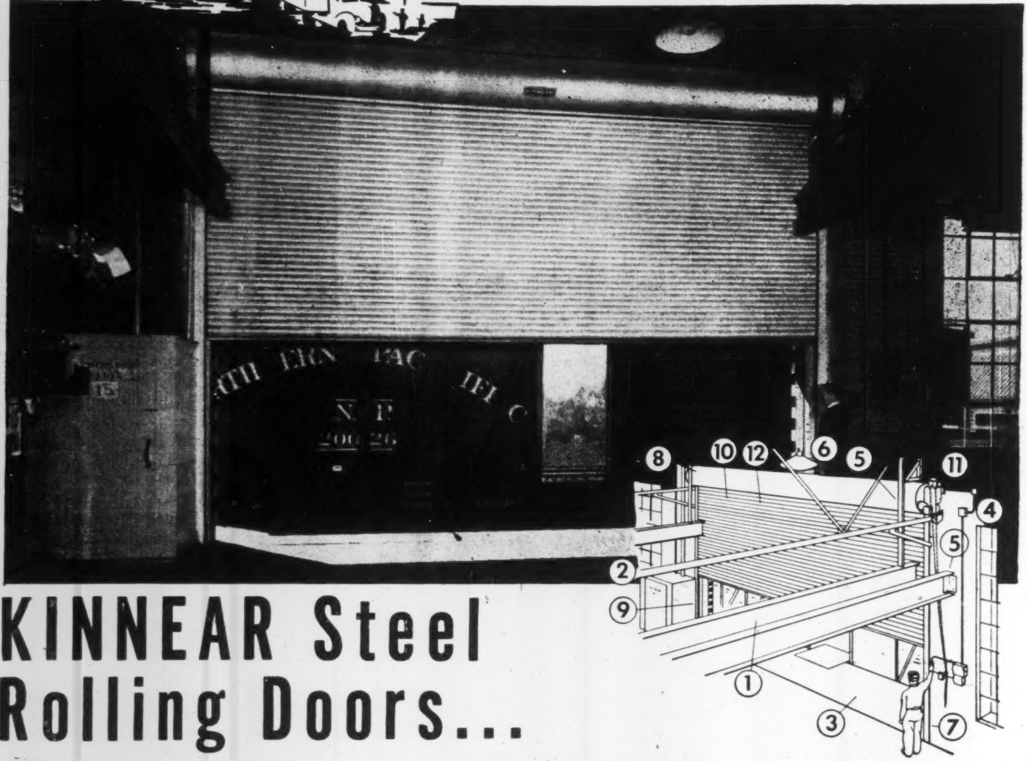
BUILDING

	1948		1949				1950				1951				1952	
21 Cties	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June
Atlanta	302	308	308	308	309	313	316	316	339	339	339	339	339	351	351	353
Baltimore	375	387	387	349	354	351	354	375	391	387	398	403	398	413	410	414
Birmingham	320	321	326	329	330	320	321	321	328	345	351	351	351	353	355	358
Boston	363	357	357	362	361	372	375	379	396	392	404	407	412	410	411	422
Chicago	360	353	350	349	352	353	361	381	404	391	401	395	403	413	415	416
Cincinnati	374	374	358	356	362	362	360	368	406	392	400	398	395	401	400	406
Cleveland	352	339	337	332	342	349	356	379	406	388	402	400	391	403	403	419
Dallas	322	322	322	322	316	318	322	323	323	338	362	362	371	371	371	371
Denver	369	365	351	351	359	359	378	395	423	400	426	432	423	425	431	433
Detroit	358	347	348	336	351	351	357	376	404	400	402	411	410	413	419	424
Kansas City	366	367	352	357	357	357	374	390	410	406	406	411	417	417	431	434
Los Angeles	368	356	343	339	336	340	360	380	392	377	403	395	381	398	394	407
Minneapolis	370	368	361	361	361	363	377	389	406	413	412	421	423	438	438	438
New Orleans	302	310	325	325	325	325	329	340	346	350	379	377	379	379	379	481
New York	403	395	400	398	397	402	410	439	464	459	466	463	457	462	460	465
Philadelphia	394	391	386	394	394	392	397	415	430	449	449	449	456	461	462	472
Pittsburgh	376	384	384	374	375	377	382	387	401	397	400	400	405	416	416	416
St. Louis	385	391	386	375	379	377	384	396	431	421	432	436	422	427	429	444
San Francisco	350	347	341	341	341	345	352	361	383	389	375	380	377	379	383	358
Seattle	328	328	328	328	340	341	344	358	374	374	384	384	389	383	389	389
Montreal	314	316	315	316	316	314	317	317	346	345	363	378	385	385	383	393

Components of Building Cost Index and weighting in U. S. cities are: 25 cwt structural steel shapes, base mill price; 6 bb portland cement, bulk, 1.088 Mfbm 2x4 S4S lumber, 68.38 hr skilled labor, at local prices. In Montreal steel weighting is 15 cwt and cement, 10 bbl. Other elements are same as for U. S. cities.

These ENR Cost Indexes measure movements in the cost to contractors and engineers of construction materials and labor. They do not adjust for productivity. Where major differences between cities occur, the main reason is found usualy in wage differentials. Lower wages are often accompanied by lower productivity, hence allowances for job productivity should be made in estimating end-product-price, or construction-se ling-price trends based on the cost trends shown here.

No other door offers all of these cost-cutting ADVANTAGES



KINNEAR Steel Rolling Doors...

1. Overhead crane rails, extending only an inch or two from face of door, *can't* interfere with door action. All overhead space is available for hoist, crane and conveyor equipment.

2. All floor space around Kinnear Rolling Doors is fully usable at all times.

3. No sacrifice of space on narrow loading platforms with Kinnear Rolling Doors. They need no room inside or outside the building for opening and closing action.

4. Windows can be placed right next to Kinnear Rolling Doors . . . they are never blocked off when the doors are operated.

5. Supports or other superstructure can be placed close to sides, front and top of Kinnear Rolling Doors—inside or outside the building.

6. Light from overhead fixtures is never blocked off by Kinnear Rolling Doors, they coil compactly above the opening.

7. Wind can't blow Kinnear Doors back and forth, or damage them. Edges are anchored in steel tracks from floor to ceiling!

8. Kinnear Rolling Doors open straight upward, coiling completely out of the way of traffic, safe from damage.

9. The opening is cleared from jamb to jamb and floor to lintel. No projecting edges or parts to obstruct opening.

10. A continuous curtain of strong interlocking steel slats gives you extra protection against fire, theft, intrusion, wind, weather and accidental damage.

11. Kinnear smooth, upward action is ideal for time-saving motor operation, with convenient remote control. Rugged Kinnear motor operators do the trick.

12. Kinnear's interlocking steel slat curtain is rugged and longer lasting. Slat surfaces are heavily zinc-coated by the hot-dip process, and a special Kinnear Paint Bond is applied to assure lasting paint adhesion. Any number of slats can be individually replaced if accidentally damaged. Lower maintenance costs!

You get many other advantages in addition to those highlighted above in Kinnear Rolling Doors. They are built any size, with motor or manual operation. Easily installed in old or new buildings. Write for complete information or recommendations.

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Offices and Agents in All Principal Cities

Building cost index roundup

Yearly averages, 1913 = 100

WEIGHTED	Orig. Base	1926	1932	1939	1942	1945	1946	1948	1949	1950	1951	1952
ENR Construction	1913=100	208	157	236	276	308	346	461	477	509	542	424 Aug.
ENR Building	1913=100	185	141	197	222	239	262	345	352	375	401	585 Aug.
American Appraisal*	1913=100	217	155	200	241	271	322	490	490	500	532	550 June
Assoc. Gen. Contr.	1913=100	197	171	188	209	231	257	332	342	357	377	382 June
Boeckh, U. S. aver	1926–29=100	181	144	191	214	252	275	365	369	386	415	430 June
Marshall & Stevens	1926=100	185	130	183	218	248	288	368	365	390	430	427 June
Smith, Hinchman & Grylls*	1926=100	185	128	199	226	285	319	405	395	426	476	496 July
ICCRR Sta & Off Bldgs	1910–14=100†	184	141	166	208	244	291	364	368	390	412	....
WR & A—RC Bldg Pac Div	1911–14=100†	191	153	192	240	248	273	393	416	426	460	466 Jan.

* Correct for productivity.

CONTRACTOR	Orig. Base	1926	1932	1939	1942	1945	1946	1948	1949	1950	1951	1952
Aberthaw	1914=100†	197	168	190	223	236	279	321	312	321	370	383 June
Austin	1926=100	185	117	152	213	234	273	317	307	313	337	340 June
Fruin-Colnon	1926=100	218	178	208	227	247	285	382	382	398	433	456 June
Fuller	1913=100	202	157	195	229	241	290	380	382	377	405	413 July
Turner	1913=100#	195	136	182	245	263	318	422	414	427	478	489 July

† Not converted to 1913=100. # 1939 = 100 will be used in the future.

Each cost index above arrives at its answer by a different route, some adjust for estimated productivity, some do not. All show that the construction price rise has not been stopped.

These indexes are charted on the accompanying colored insert. They are also defined there to show their purpose and method of construction. They are plotted against a background of ENR indexes to illustrate their similarities and differences.

The ENR Building Cost Index steers a middle third route through them. At mid-1952 it averages 414, with three contractor indexes lower, two higher. It is close to their average of 416. In 1950, three contractor indexes are above and two are below ENR, and their average of 367 compares with ENR BC index of 375. In both cases the ENR values are closer to the average than are any of the five indexes studied.

Industrial equipment cost indexes

Marshall & Stevens, Inc. of Ill., Chicago, 1926 = 100

Industry	1929	1932	1939	1945	1946	1947	1948	1949	1950	1951	3/52	6/52
Average of All	**91.9**	**66.1**	**84.8**	**103.4**	**123.2**	**150.6**	**162.8**	**161.2**	**167.9**	**180.3**	**180.2**	**180.3**
Commercial (aver. of 12*)	91.8	67.6	86.8	105.2	120.9	146.9	158.6	152.7	159.8	171.8	170.6	171.4
Transportation—garage	91.5	69.2	83.6	100.9	123.9	157.0	171.1	170.3	179.7	194.6	194.8	195.0
Public utility (aver. of 2*)	91.8	70.1	82.9	97.5	119.5	145.8	159.6	159.7	164.8	176.1	176.2	176.4
Process (aver. of 9*)	90.5	73.2	83.6	103.8	123.0	149.1	161.9	161.1	166.6	178.1	178.3	178.4
Food (aver. of 10*)	92.6	68.5	84.9	104.1	126.1	156.8	169.7	169.2	177.1	189.7	189.8	190.0
Metal working	92.3	67.9	83.6	110.7	131.2	151.3	161.8	161.8	166.9	178.0	178.1	178.4
Aircraft	93.0	66.7	85.0	109.8	127.0	162.9	178.3	177.5	186.1	201.0	201.2	201.5
Mach. and parts, elec. equip.	92.0	68.0	83.4	106.8	130.3	156.6	167.4	167.7	175.0	188.6	188.7	189.0
Textile	91.1	67.8	83.7	101.8	122.1	146.6	157.4	157.3	165.9	192.1	192.8	193.0
Woodworking	92.0	67.2	83.6	100.9	123.0	149.6	160.4	160.4	165.5	176.6	176.7	176.9
General (aver. of 7*)	95.5	68.8	84.6	103.2	122.0	149.7	162.0	161.8	168.2	180.4	180.5	180.6
Cold Storage—refrigerating	92.0	70.0	82.1	101.7	125.7	163.2	176.6	175.8	185.2	200.1	200.3	200.5
Contractors' equipment	91.0	71.9	82.4	102.5	124.2	150.3	161.1	161.1	166.2	177.3	177.4	177.6

* In each of these groups, MARSHALL AND STEVENS reports separate comparative equipment cost trends for:

COMMERCIAL: Apartment, bank, church, hotel, library, restaurant, school, store, theatre, hospital, dwelling, office

GENERAL: Laundry, mining and milling, motion picture, printing, shipbuilding, warehouses, logging

PUBLIC UTILITY: Steam power, electric power

PROCESS: Distillery, cement, chemical, glass, petroleum industry, paint, paper, rubber, clay products

FOOD: Bakery, bottling, brewery, candy, cannery-fish, cannery-fruit, creamery, dairy (flour, cereal feed), packing-fruit, packing-meat

• **M&S** indexes cover both comparative building costs, 1902 to date, and comparative equipment costs, 1913 to date.

The building indexes are national averages with a system of modifiers to get regional and municipal values for each of four types of building. A. Fireproof, protected steel, B. Fireproof, reinforced concrete, C. Masonry buildings, D. Frame. They are designed to reflect normal costs in line with recognized or published prices of building materials, equipment and labor. Extraordinary or intangible conditions are not included. Composite building cost series is converted to 1913 = 100 for table at top of this page and for the colored insert.

Comparative equipment costs, developed to cover the composite of the entire plant, machinery of various kinds, mechanical installation, furniture and fixtures, hand tools and other are combined in proper proportion to their average occurrence in each plant and computed for 47 industries. Eleven series are reproduced here, five of which are averages of 3 or more M&S related series. These are M&S estimates of actual costs paid for installed plant equipment, as a whole.

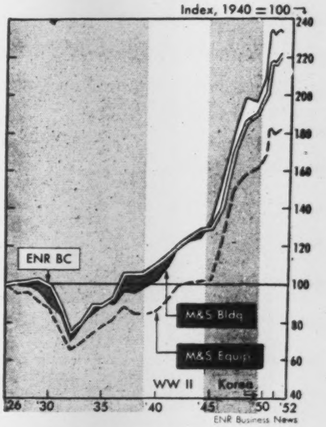
Building Cost Index

American Appraisal Co., Milwaukee

30-cities average and 22 individual cities, 1913 = 100

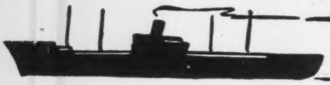
	'26	'32	'39	'42	'45	'49	'50	'51	June '52
U. S. Av., 30 cities	217	155	200	241	271	490	500	532	550
Boston	224	169	210	248	270	485	506	532	565
New York	234	170	219	248	272	503	513	545	554
Buffalo	219	157	205	247	279	506	513	551	582
Baltimore	224	166	198	248	277	510	517	545	566
Philadelphia	225	161	196	247	275	481	498	524	538
Pittsburgh	236	172	219	249	279	486	496	524	534
Cincinnati	217	157	209	242	272	477	480	508	519
Cleveland	233	160	206	245	268	485	504	537	549
Chicago	219	162	205	235	260	452	467	503	529
Indianapolis	219	157	206	247	276	501	506	535	566
Detroit	224	148	208	252	278	500	516	549	572
Milwaukee	218	144	209	254	280	493	513	558	580
Minneapolis	197	148	202	235	266	453	462	493	516
Kansas City	220	156	209	239	268	469	478	504	512
St. Louis	230	163	208	238	265	478	487	523	544
Atlanta	211	147	186	240	278	514	522	558	588
Dallas	204	146	171	209	246	455	461	483	503
New Orleans	217	145	194	234	277	501	509	533	541
Denver	204	149	195	226	245	441	453	480	497
Seattle	199	141	196	244	277	509	518	553	576
San Francisco	188	144	183	225	244	446	461	491	504
Los Angeles	195	141	167	213	249	475	488	517	527

• **American Appraisal Company**, Milwaukee, Wis.—This index is based on detailed analysis of materials and labor required for four types of buildings (frame, brick, concrete and steel) in 30 representative cities. It is repriced monthly in accordance with: 1. prevailing wage scales and labor performance for the various building trades, and 2. quotations for construction materials in 30 key cities in the United States. The index corrects for labor productivity but assumes normal average conditions and does not give any recognition to overtime or bonus payments to labor or premiums paid for materials in individual cases or under temporary abnormal conditions. It applies to construction only, does not include plumbing, heating, lighting, sprinklers, fixtures and decorations.



INDUSTRIAL EQUIPMENT prices have climbed less than building costs.

WATER Paces Business Growth!



FLORIDA'S FASTEST GROWING CITY realizes the importance of an adequate water supply to future growth. In addition to the busy harbor and large rail and truck terminal facilities, there are over 450 local industries in Jacksonville, the industrial and transportation capital of Florida.

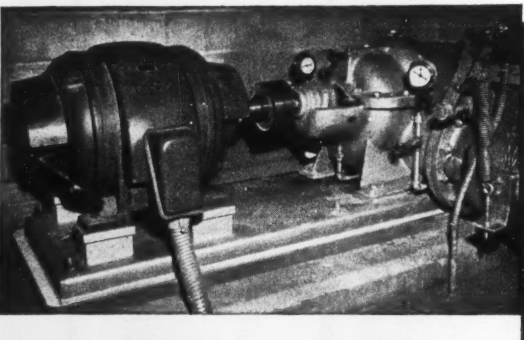
From this modern deep water harbor on the South Atlantic coast, ships fan out to European, South and North American ports. To handle requirements foreseeable for the next decade, Jacksonville is now completing a $7,000,000 water system expansion program under the direction of Utilities Commissioner J. Dillon Kennedy... engineering by Reynolds, Smith and Hills.

The performance record of previously installed Allis-Chalmers equipment (far right) was considered in ordering *thirty-four* new Allis-Chalmers centrifugal pumps and induction motor drives with a total capacity of 73 million gallons a day. Water storage capacity has been raised from 11,570,000 to 22,000,000 gallons and peak pumping rate increased to 94 M.G.D. Maximum daily consumption has been 45,016,000 gallons in the area served.

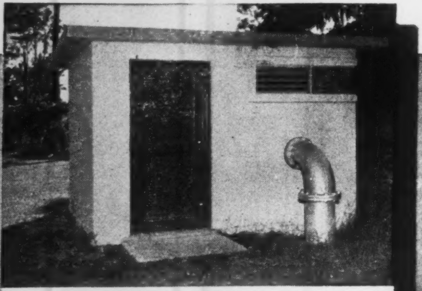
If *you* are planning on expansion or modernization, do as Jacksonville and other leading cities are doing—take advantage of Allis-Chalmers knowledge and facilities for handling municipal pumping problems. Call your nearest A-C sales office or write to Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for illustrated Bulletin 52B6059G.

A-3527

Allis-Chalmers Equipment Used in Water Works Expansion



INSIDE A PUMP HOUSE, a 50 hp, 1160 rpm induction motor drives a 12 x 12 in. centrifugal pump rated 3300 gpm against 40 ft head. *Twenty-four* Allis-Chalmers installations were made in pump houses similar to this and eight were installed in underground pump houses. Quietness of operation is an important factor since many of the wells are located in residential areas.



EACH ARTESIAN WELL formerly supplied water under artesian pressure to the reservoirs where it spilled over splash boards and baffles to eliminate entrained hydrogen sulphide. Modern pump houses containing Allis-Chalmers pumps and motors now raise pressure so that water can be aerated by spraying, and also increase well flow during peak load periods.

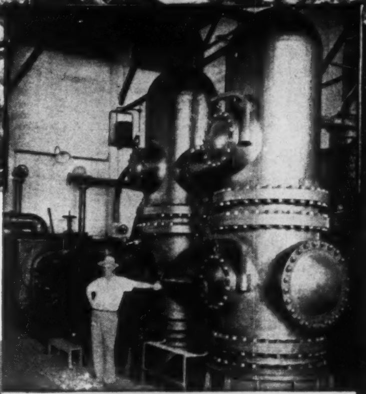
ALLIS-

Builders of the

JACKSONVILLE
Florida's Gateway City is Worldwide Distribution Point

Metropolitan Jacksonville, showing terminal facilities and portion of eight-mile developed waterfront on the St. Johns river.

AT HENDRICKS AVENUE pumping station, the two Allis-Chalmers pump-motor teams shown increased capacity 2,664,000 gpd. At left is a 5 x 4 in. centrifugal pump rated 750 gpm at 165 ft head and driven by a 50 hp induction motor. At right is a 6 x 5 in. pump delivering 1100 gpm at 165 ft head and driven by a 60 hp motor. Water storage facilities have been greatly increased.

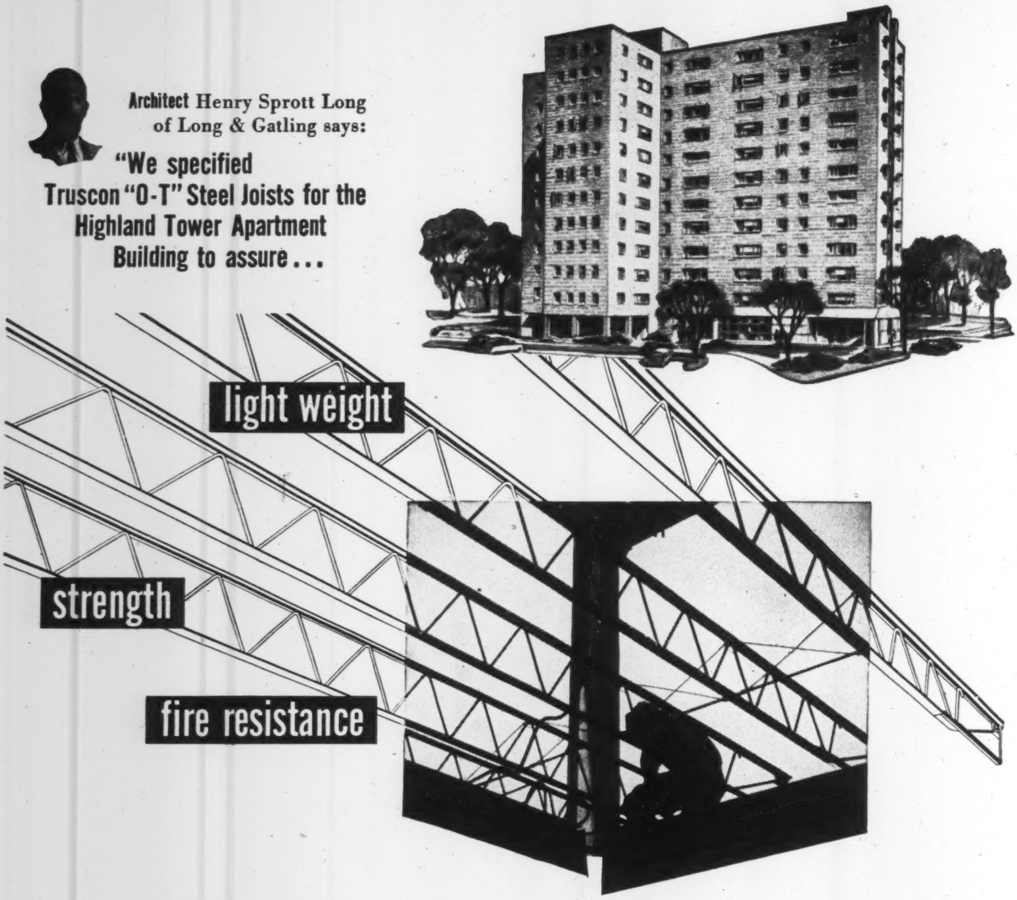


AFTER 33 YEARS ON THE JOB this Allis-Chalmers veteran steam reciprocating pumping unit is still in daily operation at the Main Street pumping station. Rated 12 M.G.D. against 150 ft head, it is a fine example of the long life built into A-C equipment. City water was first distributed in Jacksonville in 1880 . . . today there are well over 50,000 metered connections.

CHALMERS

World's Widest Range of Public Works Equipment

A-C ALLIS-CHALMERS



Architect Henry Sprott Long
of Long & Gatling says:

"We specified Truscon "O-T" Steel Joists for the Highland Tower Apartment Building to assure . . .

Hundreds of structures such as the Highland Tower Apartments in Birmingham, Alabama, indicate the trend toward lower cost per square foot construction while assuring adequate strength and safety with Truscon "O-T" Steel Joists.

Light Weight. The light weight of Truscon "O-T" Steel Joist construction lessens the time and labor required for erection and also saves materials in the supporting framework and foundations. Every detail of joists and attachments has been perfected by practical experience to simplify installation and assure dependable results.

Strength. Wide, specially formed members for top and bottom chords impart stiffness to Truscon "O-T" Joists and keep them true to line. The continuous steel web member, of uniform diameter throughout its entire length, is securely welded to the chords by means of high pressure electric automatic welding.

Fire Resistance. Fire tests prove that ¾ inch of cement or gypsum ceiling plaster protects Truscon "O-T" Open Truss Steel Joist Construction against high temperatures. The majority of insurance rating bureaus have recognized the merits of this construction and have accordingly given it a first-class fireproof classification.

See SWEET'S for complete specifications on Truscon "O-T" Open Truss Steel Joists. Write for illustrated literature describing the entire line of Truscon Steel Building Products.

TRUSCON® STEEL COMPANY
1064 ALBERT ST. • YOUNGSTOWN 1, OHIO
Subsidiary of Republic Steel Corporation

TRUSCON MARK OF MERIT PRODUCTS

TRUSCON a name you can build on

Index of building costs—U. S. average 1926-'29=100

E. H. Boeckh & Assoc., Inc., 1406 M Street, N. W., Washington, D. C.

Annual Averages By Cities	Residences Frame	Residences Brick	Apartments, Hotels, Office Bldgs. Brick and Wood	Apartments, Hotels, Office Bldgs. Brick and Conc.	Apartments, Hotels, Office Bldgs. Brick and Steel	Commercial & Factory Bldgs. Frame	Commercial & Factory Bldgs. Steel	Commercial & Factory Bldgs. Brick and Wood	Commercial & Factory Bldgs. Brick and Steel	Commercial & Factory Bldgs. Brick and Conc.
U. S. AVERAGE										
1926–29	101.4	102.5	102.5	102.8	101.3	102.2	100.8	101.7	102.2	104.6
1939	101.2	104.4	104.1	111.2	109.4	101.3	110.4	105.0	112.1	113.3
1946	161.8	161.9	161.7	154.0	154.8	165.6	145.0	158.7	154.8	156.0
1949	213.8	215.6	215.0	208.1	208.4	218.4	195.5	211.9	208.7	211.4
1950	225.9	227.1	226.7	216.5	217.0	231.3	203.2	222.2	217.4	218.8
1951	243.3	244.9	244.5	232.7	234.2	248.6	219.8	240.2	234.4	234.5
June '52	249.8	252.5	251.9	242.1	241.3	255.8	226.4	247.8	243.4	245.3
ATLANTA AREA										
1926–29	82.7	87.0	84.2	83.7	87.0	82.9	94.5	84.7	87.5	86.8
1939	82.8	86.0	86.1	95.1	95.0	80.6	96.2	88.6	94.6	97.4
1946	149.2	148.1	148.2	136.8	139.9	151.7	130.0	146.8	135.1	136.4
1949	189.9	189.3	189.3	180.6	185.4	191.7	172.7	186.5	177.5	180.8
1950	196.2	194.3	194.7	185.4	191.0	199.3	183.0	190.0	185.0	183.7
1951	214.6	212.8	213.2	204.2	211.4	218.1	204.8	208.0	205.0	202.8
June '52	219.9	217.7	217.8	210.8	217.1	223.7	213.2	211.5	212.1	208.2
BALTIMORE AREA										
1926–29	107.2	112.0	107.6	100.6	100.7	106.3	95.5	106.8	96.8	101.2
1939	93.5	95.5	95.6	99.3	99.2	94.0	101.7	96.6	101.4	100.2
1946	163.1	161.7	162.2	149.1	150.8	167.6	138.9	158.8	150.0	148.2
1949	216.4	217.4	217.3	204.5	204.8	220.5	191.8	216.6	204.6	208.5
1950	231.0	231.8	232.1	215.0	216.8	234.9	204.2	230.6	217.7	216.5
1951	247.7	249.2	249.6	229.9	232.6	251.0	217.8	248.6	232.6	231.0
June '52	254.4	256.6	256.9	240.2	241.5	258.6	226.1	255.8	243.4	242.8
BIRMINGHAM AREA										
1926–29	91.7	96.7	94.1	95.5	96.8	90.2	97.5	94.6	96.3	96.3
1939	87.8	90.9	91.5	96.1	96.2	84.9	96.9	95.1	95.6	96.3
1946	149.3	147.4	147.9	137.3	139.4	149.7	128.1	145.4	135.2	137.4
1949	188.2	187.2	187.6	178.9	182.0	192.8	172.6	183.7	177.7	180.0
1950	196.3	196.1	196.8	186.6	189.4	200.6	179.2	193.9	186.2	187.6
1951	213.7	212.7	212.7	200.4	204.7	217.4	192.0	209.8	199.7	200.2
June '52	217.9	217.6	217.2	205.7	208.7	222.1	195.1	213.8	205.4	205.7
BOSTON AREA										
1926–29	116.3	120.3	115.4	106.2	107.0	118.8	106.3	112.5	108.7	105.8
1939	106.2	110.4	110.1	116.3	113.7	105.7	114.2	111.5	118.2	118.5
1946	167.0	166.5	166.0	156.8	156.6	172.1	147.1	161.1	158.5	160.4
1949	223.0	226.5	225.9	216.7	215.6	227.1	201.3	222.9	218.2	221.9
1950	234.6	237.8	236.8	227.3	225.5	240.3	210.9	231.8	229.8	232.5
1951	252.2	255.9	255.1	243.6	243.3	257.5	227.5	250.9	247.0	247.8
June '52	258.3	262.6	261.6	250.7	248.3	263.7	231.5	257.9	253.4	256.0
CHICAGO AREA										
1926–29	109.2	114.2	109.8	113.2	109.1	112.9	105.2	105.9	112.0	116.0
1939	110.6	112.5	111.1	123.6	118.7	114.2	117.6	109.3	122.6	127.6
1946	168.3	166.0	164.2	158.9	156.9	168.1	144.5	157.4	157.0	162.5
1949	219.2	218.3	216.1	210.6	208.7	229.1	193.3	207.7	210.4	215.1
1950	231.9	229.7	227.4	217.8	216.8	243.4	201.2	216.5	219.5	222.6
1951	248.7	246.2	243.8	234.7	233.6	261.1	216.6	231.3	235.4	238.4
June '52	258.2	256.9	253.7	248.1	242.2	271.2	223.3	241.8	245.8	254.3
CINCINNATI AREA										
1926–29	100.5	105.0	101.3	101.0	100.2	100.2	99.6	103.1	100.6	101.0
1939	103.3	106.2	105.9	113.9	110.4	103.3	111.7	107.1	113.7	116.5
1946	165.6	166.8	166.7	154.5	154.7	167.5	140.7	166.4	154.4	156.1
1949	214.1	216.6	215.8	207.5	206.0	217.9	193.5	214.1	208.4	212.2
1950	220.3	224.1	223.1	213.9	211.7	224.3	199.1	220.4	215.6	218.7
1951	238.2	242.9	242.2	229.5	228.6	241.1	213.6	242.9	231.8	232.9
June '52	247.2	254.2	252.7	244.2	239.8	251.0	222.9	253.5	245.2	250.5
CLEVELAND AREA										
1926–29	107.2	113.4	108.5	111.3	108.3	109.0	103.0	107.2	110.5	114.8
1939	106.2	109.6	109.5	115.3	112.8	107.5	112.9	109.5	117.7	118.0
1946	169.2	169.4	168.7	160.2	159.9	174.1	146.4	164.3	161.0	165.9
1949	224.8	225.7	223.6	216.0	213.0	233.0	198.5	218.0	217.2	220.9
1950	237.9	237.8	235.4	227.8	224.1	248.1	207.2	227.6	228.4	232.3
1951	255.0	255.8	253.1	243.8	240.8	265.8	221.5	245.6	244.5	248.3
June '52	265.8	267.5	264.6	258.8	252.9	277.5	232.8	256.9	259.7	265.0
DALLAS AREA										
1926–29	103.1	107.3	103.2	98.9	99.1	103.6	100.5	100.9	99.4	99.7
1939	95.1	95.8	96.7	98.8	100.2	94.8	106.6	96.0	101.9	98.9
1946	150.2	148.8	149.4	139.8	144.4	153.5	140.3	144.6	142.5	141.1
1949	207.2	206.2	206.9	197.1	201.3	210.3	197.1	203.2	201.5	195.4
1950	220.5	221.2	222.1	209.0	212.5	221.3	206.3	218.6	210.1	208.3
1951	236.7	236.9	238.3	226.2	231.9	238.3	235.1	232.6	232.3	224.3
June '52	240.5	243.5	245.0	233.8	236.3	239.6	237.6	241.5	236.6	234.4
DENVER AREA										
1926–29	95.0	99.7	95.5	102.4	99.6	95.5	105.5	94.6	101.4	108.0
1939	112.1	112.0	111.2	116.1	114.4	114.3	118.7	109.5	117.0	117.8
1946	160.1	160.3	150.4	155.3	157.9	164.0	155.6	156.8	160.0	158.3
1949	212.9	215.8	215.9	211.0	213.1	216.2	207.0	214.3	214.6	215.3
1950	228.2	230.0	229.8	218.8	221.2	232.4	212.3	226.2	221.2	221.3
1951	246.6	249.7	249.6	236.5	240.1	249.2	228.4	246.9	238.9	237.2
June '52	248.5	251.7	251.6	239.3	242.7	250.4	230.8	248.1	241.8	239.6
DETROIT AREA										
1926–29	103.3	108.4	104.3	102.9	102.4	103.7	103.1	103.5	103.3	104.4
1939	98.8	102.7	102.9	108.6	107.5	98.7	108.8	104.2	111.4	110.1
1946	165.9	165.9	165.8	157.4	157.9	171.3	147.5	160.9	160.0	159.7
1949	221.0	222.6	221.9	212.2	211.5	227.0	196.8	216.8	214.2	215.9
1950	233.0	234.0	233.3	222.8	222.0	240.0	208.1	227.1	226.0	225.7
1951	250.4	251.3	250.2	238.3	238.2	258.4	221.9	242.9	241.4	241.0
June '52	258.5	259.8	258.2	248.3	245.2	268.1	227.7	250.9	250.6	253.0
KANSAS CITY AREA										
1926–29	100.3	106.5	102.2	105.7	103.3	101.1	105.9	101.9	107.5	108.8
1939	104.4	109.9	109.8	118.3	115.4	103.8	117.2	113.0	120.0	121.6
1946	166.5	165.6	165.4	158.2	159.5	172.3	151.0	159.8	159.3	160.3
1949	215.9	216.7	216.3	209.0	211.1	221.8	199.4	210.0	211.3	211.5
1950	230.5	229.6	228.7	216.0	218.8	238.1	203.6	219.6	217.7	217.8
1951	248.7	249.0	248.5	232.0	235.5	255.2	218.9	240.6	234.4	233.4
June '52	257.2	260.9	260.0	248.1	247.4	265.3	236.0	254.1	251.3	254.1
LOS ANGELES AREA										
1926–29	92.7	97.9	93.5	98.8	96.8	93.5	97.0	91.3	97.5	103.1
1939	93.6	97.2	97.5	103.7	105.0	95.6	109.5	96.8	106.2	104.9
1946	155.1	156.1	156.2	155.3	156.7	160.1	158.3	150.9	160.0	158.7
1949	203.2	207.0	206.0	209.9	210.7	205.3	201.2	201.8	210.2	212.4
1950	222.8	224.1	223.4	217.4	219.2	227.8	205.5	215.4	217.5	219.0
1951	239.5	241.0	240.3	235.1	237.6	245.9	224.6	232.2	236.6	236.9
June '52	243.5	243.5	242.5	236.5	237.5	250.9	224.7	234.3	237.5	237.7
MINNEAPOLIS AREA										
1926–29	92.8	98.2	94.6	95.6	96.1	92.8	100.0	93.9	97.9	98.4
1939	101.9	105.0	104.2	113.5	110.7	102.7	113.4	103.6	114.5	117.2
1946	163.7	167.6	167.5	156.5	155.7	164.9	142.6	168.2	157.2	159.5
1949	218.7	218.7	217.7	205.1	206.9	224.4	192.6	211.7	205.8	208.0
1950	228.2	227.9	227.0	210.1	213.2	234.4	198.2	220.3	215.6	211.3
1951	248.0	248.1	247.4	229.0	232.3	253.9	216.1	241.7	231.7	229.9
June '52	256.5	255.5	254.3	237.6	238.5	263.5	220.6	250.1	238.0	238.6
NEW ORLEANS AREA										
1926–29	93.3	96.3	93.4	86.5	90.6	93.3	93.7	91.5	89.5	86.5
1939	89.0	90.3	91.3	95.4	98.3	88.1	102.8	91.7	98.5	94.9
1946	148.9	147.4	148.2	138.6	142.8	151.2	138.7	145.4	142.0	138.7
1949	201.6	201.4	202.0	188.8	194.6	204.9	186.0	200.0	191.8	189.8
1950	211.7	210.3	211.0	196.2	203.1	215.8	194.4	206.4	199.5	195.3
1951	226.4	224.4	225.2	207.7	216.4	220.6	205.9	220.1	211.0	205.7
June '52	231.3	229.8	230.4	215.1	221.6	236.0	210.2	225.2	217.7	213.8
NEW YORK CITY AREA										
1926–29	133.3	138.4	131.9	122.8	120.4	137.5	113.1	127.4	123.2	125.3
1939	122.1	123.3	122.5	130.6	125.9	125.6	123.7	119.6	130.0	133.3
1946	182.4	181.8	181.1	177.2	174.6	188.1	158.6	177.4	174.8	179.0
1949	240.8	243.7	242.7	242.8	238.2	247.5	217.3	238.3	240.0	246.4
1950	254.5	256.2	255.2	249.5	246.1	262.1	224.2	249.7	248.0	251.5
1951	271.3	273.2	272.2	263.7	261.1	277.9	239.3	267.0	262.2	265.2
June '52	274.0	277.5	276.1	270.1	265.6	280.6	245.5	270.2	270.0	273.5
PHILADELPHIA AREA										
1926–29	100.3	106.3	103.7	105.9	103.1	98.1	101.9	104.2	104.1	107.5
1939	99.2	102.6	102.9	105.7	104.1	98.2	102.0	105.0	105.5	106.7
1946	165.0	163.9	164.9	153.2	154.6	169.0	141.2	161.1	152.7	154.0
1949	220.5	220.6	220.3	209.0	209.0	224.3	190.3	216.3	205.6	209.9
1950	234.4	235.1	234.8	221.2	220.7	239.3	202.0	230.5	218.8	222.8
1951	250.9	251.2	251.1	235.4	236.0	255.5	216.6	247.3	233.9	235.8
June '52	260.4	261.9	261.5	249.7	248.1	266.0	229.0	257.3	249.5	250.9
PITTSBURGH AREA										
1926–29	113.3	118.8	112.8	111.2	107.1	115.4	89.6	112.2	104.6	112.9
1939	113.8	117.0	115.7	117.5	114.2	114.2	109.8	116.5	116.9	119.1
1946	169.5	169.0	168.0	156.6	155.3	173.5	140.1	166.4	153.2	158.9
1949	227.1	229.1	227.7	215.6	212.2	231.3	186.9	227.0	209.8	219.8
1950	237.6	238.6	237.6	222.2	219.8	242.6	196.6	235.3	219.9	224.2
1951	254.3	255.1	254.1	237.4	236.6	260.2	212.3	250.3	235.6	238.4
June '52	259.2	262.1	260.7	246.4	243.7	265.4	218.2	257.0	244.2	250.2
ST. LOUIS AREA										
1926–29	118.6	121.1	115.7	109.9	108.8	121.3	103.3	111.7	107.7	109.3
1939	107.0	110.2	109.9	118.7	116.4	107.6	114.3	110.3	119.2	119.8
1946	167.4	167.1	166.2	159.1	158.9	171.7	145.3	154.8	158.1	161.1
1949	220.7	221.4	220.7	212.8	212.4	226.8	197.5	217.3	213.6	215.7
1950	230.7	232.8	233.7	221.9	220.9	240.1	204.7	229.5	222.8	225.3
1951	248.3	252.0	254.3	238.5	237.6	258.5	217.8	250.7	239.0	240.9
June '52	254.0	260.7	263.0	252.2	247.1	267.3	226.6	261.5	251.5	258.6
SAN FRANCISCO AREA										
1926–29	87.7	93.7	90.4	97.5	96.5	86.1	95.5	91.8	95.9	99.0
1939	99.2	105.7	104.5	117.4	114.4	97.6	114.9	107.4	116.5	121.9
1946	157.5	159.7	160.0	157.9	159.0	160.5	151.5	158.4	160.0	159.3
1949	207.1	213.0	212.8	214.0	213.9	210.0	203.9	213.9	216.1	213.8
1950	223.1	227.0	226.8	222.4	222.9	226.1	209.1	224.5	222.6	224.5
1951	240.4	245.2	245.3	239.6	240.9	243.9	231.5	243.5	243.1	243.1
June '52	247.8	252.9	252.5	247.2	247.1	252.3	236.6	250.1	251.0	251.0
SEATTLE AREA										
1926–29	84.5	92.2	89.2	101.7	95.1	82.4	100.8	92.2	100.5	105.9
1939	96.7	104.4	108.8	119.2	114.9	94.4	115.1	108.3	118.7	125.3
1946	152.9	158.3	157.9	161.2	159.8	154.3	156.0	158.9	164.2	167.1
1949	203.9	214.2	214.0	220.7	218.1	205.2	209.9	218.0	225.3	228.5
1950	213.6	224.1	224.0	227.1	224.7	214.3	214.1	227.8	230.3	234.5
1951	232.7	245.1	244.9	247.7	244.9	232.4	232.5	250.3	251.0	255.8
June '52	242.4	257.0	256.7	259.6	254.8	242.0	239.0	264.6	264.1	269.0
WASHINGTON, D. C.										
1926–29	106.6	107.7	107.9	107.1	105.9	106.0	104.0	108.0	106.4	108.4
1946	168.5	166.2	167.1	157.1	158.2	173.6	145.2	162.6	157.2	156.6
1949	223.1	223.3	223.1	213.5	212.6	227.2	194.8	218.6	210.4	214.6
1950	235.0	233.7	233.8	223.2	224.5	240.5	210.2	227.5	223.8	222.0
1951	252.8	251.0	251.3	236.2	239.3	258.4	225.9	244.1	239.0	234.2
June '52	259.8	258.2	257.9	244.0	244.4	266.3	229.2	250.8	244.9	243.1

Current indexes are calculated upon an actual survey at source of local construction cost conditions. Material prices used are those paid by contractors to material dealers. Labor rates are current rates paid by contractors — certain corrections being made in certain areas for labor efficiency and labor shortage. Index includes construction overhead, sales taxes, compensation insurance and social security. The indexes have been primarily engineered to use as local cost conversion factors to construction cost data released by the Boeckh organization. Complete formula is published in "Boeckh's Index Calculator Tables."

Where Boeckh index is shown in these pages on charts or tables for comparison with other building cost indexes, the average for all five Boeckh commercial and factory building indexes is used, converted to 1913 = 100.

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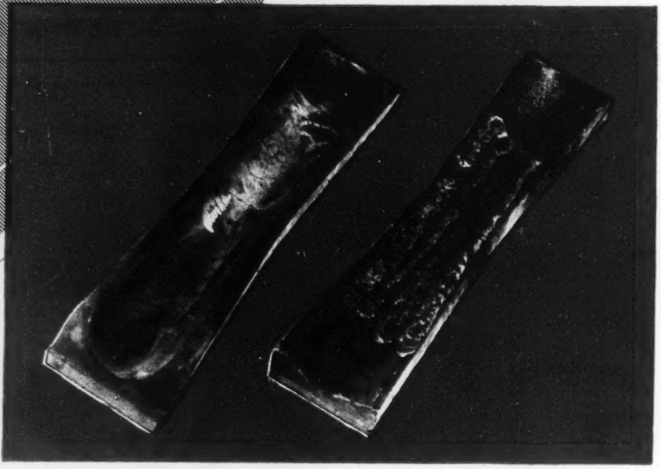

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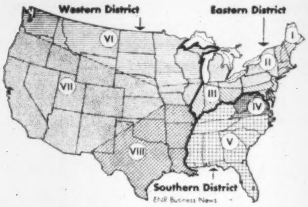


Railroad cost index road construction

ICC—1910-14 = 100

Dist & Reg	%	1926	1932	1939	1945	1949	1950	1951
I to VIII	73.09	166	131	137	197	270	276	298
I East...	75.36	173	134	140	206	287	287	310
II East....	68.15	168	133	141	202	283	289	311
III East...	67.99	168	132	144	205	286	289	312
IV South..	70.49	163	126	131	195	259	269	290
V...South..	76.66	164	129	136	195	265	274	294
VI West..	77.41	164	129	132	190	253	263	284
VII West..	75.62	166	131	133	188	256	265	287
VIII West..	78.15	167	133	140	198	270	274	295

Indexes represent territorial index factors and are not for determining unit reproduction costs for individual roads.

By Accounts	1926	1932	1939	1945	1949	1950	1951
Engineering........	166	131	137	197	270	276	298
Other rt of way exp.	159	121	135	201	258	278	298
Grading............	153	106	90	144	139	140	148
Tunnels & subways.	178	119	140	236	339	332	365
Brdg, culv & trestl..	170	122	149	240	374	364	405
Elevated structures.	165	129	149	249	382	380	428
Ties................	173	144	158	241	302	306	344
Rails...............	144	140	136	152	245	264	278
Other track material	177	163	167	176	278	278	301
Ballast.............	175	146	143	181	254	258	268
Trk laying & surf...	188	164	165	273	366	364	386
Fences snw sheds...	178	147	141	189	279	298	320
Stat & off bldgs.....	184	141	166	244	368	390	412
Roadway buildings..	187	140	162	258	386	398	419
Water stations......	182	147	166	227	327	340	359
Fuel stations.......	180	144	159	242	357	368	390
Shops & eng houses	185	137	165	248	379	397	419
Grain elevators.....	190	137	164	236	367	388	412
Storage warehouses.	189	137	166	253	377	402	426
Wharves & docks...	177	136	153	255	350	363	391
Coal & ore wharves.	174	136	153	236	341	348	378
Tel & tel lines......	157	121	129	173	250	270	290
Sgnls & intrlocks...	169	130	143	176	226	242	266
Power plants.......	186	138	167	246	386	407	436
Powr trnsmissn sys..	176	143	148	180	266	289	310
Misc struct.........	186	141	161	229	378	399	421
Roadway mach.....	151	138	154	187	270	295	319
Roadway small tools	190	155	180	200	315	353	380
Public impr const...	169	131	142	217	321	316	347
Shop mach.........	186	155	202	236	324	346	374
Power plant mach...	186	155	180	191	242	262	284
Work equipment....	180	165	200	254	348	365	394

Ratio of RR costs, 1951

	%
Road construction..............................	68.40
Equipment, work................................	0.52
Equipment, rolling & floating..................	24.51
General..	6.57
Total..	100.00

Indexes released Aug. 1, 1952, by Engineering Sect. Bu. of Valuation, Interstate Commerce Commission, include items developed from analysis of major construction contracts over a period of years. Indexes for material accounts are based on studies of carriers' returns to Valuation Order 14, joint studies made with various sub-committees of President's Conference Committee, well-known engineering and trade publications, contracts covering major construction projects and other information furnished by individual carriers.

Handy-Whitman Index—public utility construction costs

Compiled and published by Whitman, Requardt and Associates, Baltimore, Md.

Individual series for 95 cost elements in three classes of utility construction, for six geographic divisions of the United States, are reported semi-annually. Weighting is based on wide experience in cost analysis of plants and construction. Material prices from ENGINEERING NEWS-RECORD, Iron Age and various manufacturers; labor rates from utilities, unions and builders associations.

Cost trends of building construction—1911 to 1914 = 100

(Complete Index reports 14 Items entering into Building Construction Costs.)
A relates to Reinforced Concrete Bldg.; B relates to Brick Bldg.

	Jan. '26	July '26	Jan. '32	July '32	Jan. '39	July '39	Jan. '42	July '42	Jan. '45	July '45	Jan. '47	July '47	Jan. '48	July '48	Jan. '49	July '49	Jan. '50	July '50	Jan. '51	July '51	Jan. '52
North Atlantic Division																					
A	213	213	171	159	205	207	250	253	259	260	336	353	382	422	436	433	437	448	473	479	481
B	228	229	189	173	211	214	246	250	262	265	329	351	372	404	429	421	424	436	460	474	474
South Atlantic Division																					
A	213	215	171	164	204	205	260	267	274	275	375	382	419	456	462	453	465	469	491	510	510
B	226	228	185	176	209	211	255	262	272	277	358	369	397	423	431	431	434	439	456	485	485
North Central Division																					
A	203	201	169	154	200	200	237	242	249	253	326	339	371	409	421	418	423	437	463	468	472
B	212	211	181	164	203	203	229	234	248	250	310	324	352	375	389	390	394	408	433	440	442
South Central Division																					
A	192	191	149	144	188	187	232	236	242	243	318	334	364	399	411	412	418	422	445	454	454
B	203	204	160	154	191	191	223	227	235	238	299	322	341	370	382	382	387	392	408	424	426
Plateau Division																					
A	198	197	153	149	194	194	230	235	238	239	307	327	349	385	402	397	400	417	435	451	451
B	211	210	167	163	199	200	221	227	231	233	309	331	349	378	396	395	396	410	427	442	443
Pacific Division																					
A	191	190	157	148	192	192	238	241	248	248	328	343	374	411	416	415	420	432	458	463	466
B	198	197	164	156	193	193	226	231	241	242	303	329	354	378	386	385	389	400	419	435	438

Cost trends of gas plant construction—1911 = 100

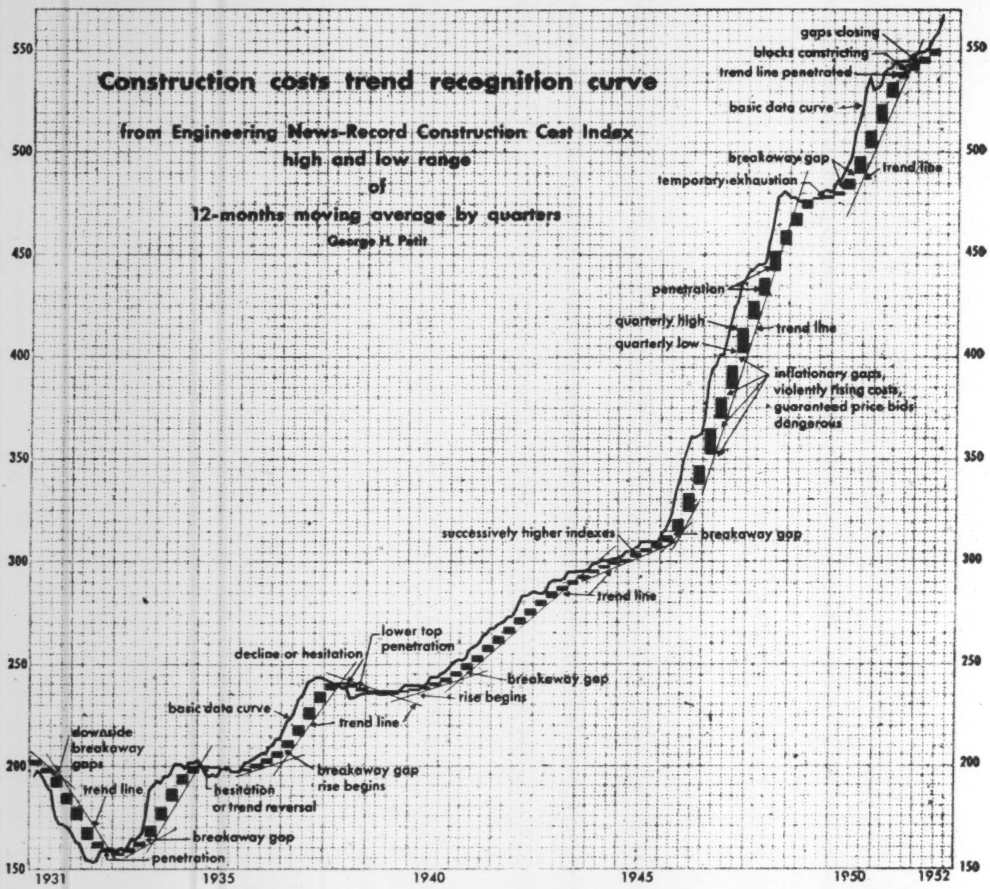
(Complete Index reports 17 Items entering into Gas Plant Construction Costs.)
A relates to Total Constr. & Equip.; B relates to Mech. Equip. Exclusive of Gas Holders

	Jan. '26	July '26	Jan. '32	July '32	Jan. '39	July '39	Jan. '42	July '42	Jan. '45	July '45	Jan. '47	July '47	Jan. '48	July '48	Jan. '49	July '49	Jan. '50	July '50	Jan. '51	July '51	Jan. '52
North Atlantic Division																					
A	230	230	202	188	241	249	272	275	283	288	366	398	413	446	469	464	467	476	514	519	527
B	212	212	209	195	274	278	297	299	296	301	387	395	403	424	447	481	479	485	549	549	553
South Atlantic Division																					
A	219	222	178	175	227	230	261	268	278	282	363	388	410	445	464	453	456	457	492	507	510
B	212	212	209	195	274	278	297	299	296	301	387	395	403	446	481	482	479	485	549	549	553
North Central Division																					
A	217	218	198	178	232	232	249	254	264	269	335	367	384	417	435	434	437	447	481	489	491
B	212	212	209	195	274	278	297	299	296	301	387	395	403	424	447	481	479	485	549	549	553
South Central Division																					
A	199	200	171	160	216	217	244	249	258	261	335	359	379	404	420	419	425	429	465	470	474
B	212	212	209	195	274	278	297	299	296	301	387	395	403	424	447	487	479	485	549	549	553
Plateau Division																					
A	202	202	176	166	216	217	232	237	240	243	313	344	359	386	403	398	401	405	440	449	453
B	212	212	209	195	274	278	297	299	296	301	387	395	403	424	447	481	479	485	549	549	553
Pacific Division																					
A	205	206	187	177	227	228	253	257	264	266	342	369	387	416	433	428	433	437	475	480	489
B	212	212	209	195	274	278	297	299	296	301	387	395	403	424	447	481	479	485	549	549	553

Cost trends of electric light and power construction—1911 = 100

(Complete Index reports 64 Items entering into Electric Light and Power Construction Costs.)
A relates to Total Constr. & Equip.; B to Accessory Electric Equipment; C to Sub-sta. Equip.

	Jan. '26	July '26	Jan. '32	July '32	Jan. '39	July '39	Jan. '42	July '42	Jan. '45	July '45	Jan. '47	July '47	Jan. '48	July '48	Jan. '49	July '49	Jan. '50	July '50	Jan. '51	July '51	Jan. '52
North Atlantic Division																					
A	197	194	182	176	224	225	248	248	251	259	327	351	357	377	401	400	399	409	462	468	472
B	197	196	192	186	225	224	241	239	226	237	308	323	323	333	340	341	341	360	413	420	420
C	184	178	172	168	203	203	217	216	207	218	273	288	288	296	306	312	312	320	352	359	359
South Atlantic Division																					
A	201	201	188	180	232	233	262	267	268	273	336	362	375	401	430	422	422	430	482	490	494
B	200	203	200	191	239	240	260	262	247	248	305	324	332	344	357	356	358	374	426	431	432
C	187	183	180	173	217	218	235	237	227	228	270	289	296	305	322	325	327	333	365	370	370
North Central Division																					
A	190	187	186	174	219	218	235	238	238	243	299	324	333	351	375	374	374	382	436	443	446
B	189	188	199	186	224	223	229	231	216	218	272	289	292	300	309	307	310	324	376	382	388
C	178	171	181	169	203	202	207	209	198	200	240	257	260	264	278	280	282	286	320	326	328
South Central Division																					
A	184	183	179	171	218	218	245	246	248	251	310	336	344	365	391	390	390	398	448	454	458
B	187	189	200	190	231	230	250	248	235	235	290	311	314	326	341	340	340	357	407	415	416
C	175	171	181	173	210	209	226	226	217	217	257	278	281	290	310	311	311	319	344	352	352
Plateau Division																					
A	190	188	177	171	218	219	234	236	238	241	300	329	334	355	378	378	376	386	436	443	447
B	197	196	194	188	231	232	237	236	225	225	279	302	303	315	322	323	323	341	390	399	401
C	185	177	175	171	209	211	213	212	207	207	246	269	269	278	289	294	294	302	332	341	342
Pacific Division																					
A	180	178	172	163	216	215	235	242	242	244	300	332	339	359	383	380	379	359	440	450	454
B	178	177	182	170	222	222	231	240	225	225	275	303	303	317	328	323	323	343	394	408	409
C	167	161	164	155	203	202	210	219	208	208	244	272	273	284	298	297	297	307	342	357	357



Can construction costs be forecast?

The fascinating possibility of being able to forecast major trends in construction costs with a fair degree of accuracy—and based on existing data—has been advanced by George H. Petit, an MIT graduate who is now a supervising engineer for The Travelers Insurance Co., at Hartford, Conn.

His system—which is in fact a new visual means of interpreting cost data for trends—is based on the ENGINEERING NEWS-RECORD Construction Cost Index. Because it distinguishes between major long-range cost movements and minor fluctuations, it seems to offer an important forecasting tool for construction men. Checked against previous known conditions, Mr. Petit's method seems accurate enough in marking trends, directions and strength.

Right now, there's a new trend in the making—Petit's chart shows the end of the rise caused by the Korean action.

The questions are: Do these signs merely indicate a pause before another rise as in 1949; or do they mean a levelling-off for a period of stability or are they getting ready for a trend reversal?

So far, there is no sure indication of the answer. But it appears from the chart that the costs are not yet ready to go down.

At the moment, only one thing is certain, according to Petit—the direction of any new trend will be clearly apparent. What's necessary is some patience, to permit the signs to develop.

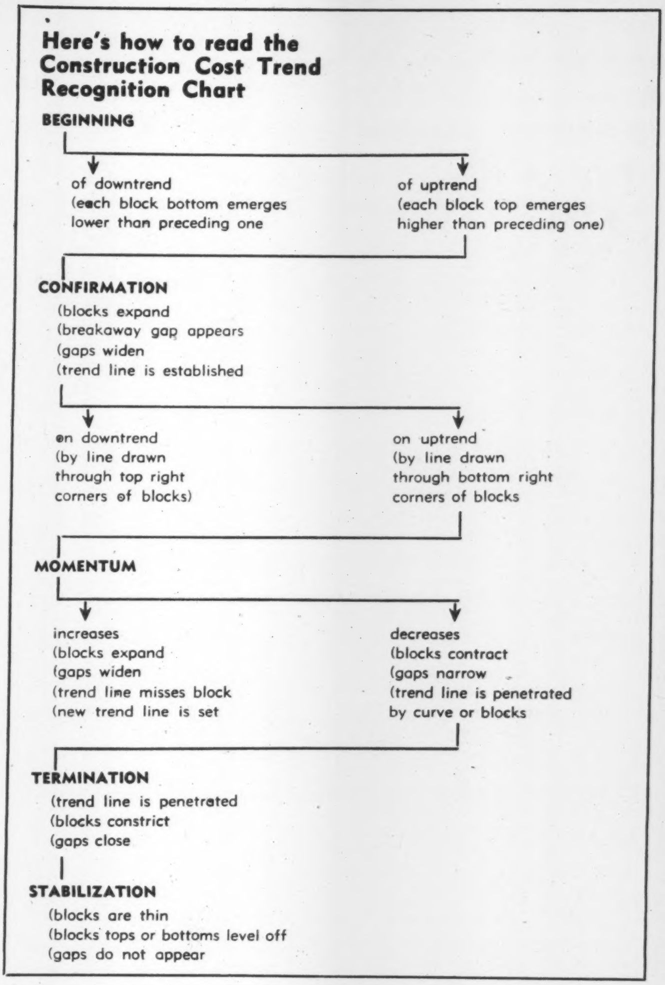
- **How it's done**—Petit makes use of three tools to arrive at his interpretation of trends:

1. By using solid blocks plotted on graph paper, he creates what amounts to a new kind of curve that will indicate and show the strength of cost movements.

To create his blocks, the insurance engineer (who saw service with Turner Construction Co. and other construction firms, before joining The Travelers) starts with the ENR Construction Cost Index.

From this index, he first computes a 12-month moving average, to remove minor and temporary ripples, and reveal the swells of long-range movement.

Then he builds his blocks by plotting for each quarter the highest and lowest points of the moving average for that period. The space between


Here's how to read the Construction Cost Trend Recognition Chart
BEGINNING
of downtrend
(each block bottom emerges lower than preceding one
of uptrend
(each block top emerges higher than preceding one)
CONFIRMATION
(blocks expand
(breakaway gap appears
(gaps widen
(trend line is established
on downtrend
(by line drawn through top right corners of blocks)
on uptrend
(by line drawn through bottom right corners of blocks
MOMENTUM
increases
(blocks expand
(gaps widen
(trend line misses block
(new trend line is set
decreases
(blocks contract
(gaps narrow
(trend line is penetrated by curve or blocks
TERMINATION
(trend line is penetrated
(blocks constrict
(gaps close
STABILIZATION
(blocks are thin
(blocks tops or bottoms level off
(gaps do not appear

these points is filled in solidly.

2. As the blocks are plotted, gaps may appear between them, depending on readings of the moving average in the period. These gaps are used to measure momentum and confirm direction of the cost movement.

3. Finally, Petit applies trend lines to his graph: If there's an uptrend, the lines are drawn from the lower right hand corner of the blocks; if a downtrend, from the top right corner.

• **How it works**—Here's how Petit now reads his chart:

First point of interest is the blocks. He assumes that if succeeding blocks, by quarters, are higher (that is, the highest value of the moving average for the quarter is higher than for the preceding quarter) than their predecessors, there is an uptrend.

If succeeding blocks have bottoms lower than their predecessors, there's a downtrend.

It therefore follows that when the blocks are expanding—either downward or upward—the movement is gathering strength. When they contract, the movement is weakening or ending.

Next step is to assess the gaps between the blocks, if any. When a gap appears (breakaway gaps, Petit calls them) it indicates a sharp change in the situation—thus the start of a major movement. And again it follows that the larger the gap, the more momentum the trend is picking up.

Final point is the action of the trend-lines. Plotted to follow the movement of the blocks, the trend line, says Petit, indicates the steadiness of the movement in the direction indicated. This line is projected as a straight line to touch only the corners (either upper or lower, depending on direction of the trend) of succeeding blocks. If the line begins to penetrate the succeeding blocks, rather than touch their corners, the penetration indicates a slowing of the movement—or the beginning of its end.

"However," cautions Petit, "the trend-line penetration of the blocks is only one of the requirements that indicate a positive turn in the trend. All three indicators—shrinking of the size of the blocks, closing gaps and penetration—must appear before you can dependably identify a new direction or movement."

• **Performance**—Plotted and then compared with known cost trends over past years, Petit's system works very well. Apparently, it would have made a good basis on which to plan construction work.

Four of the things the system does very well are: Revealing uptrends or downtrends of great momentum; trend reversals; cost stability over extended periods; slow or minor movements.

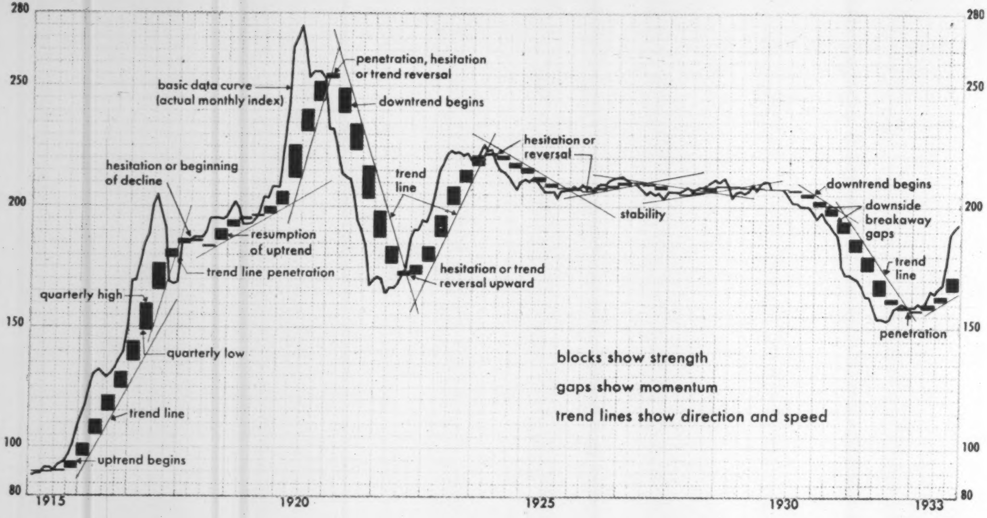
A glance at the accompanying reproduction of the Petit chart will show how closely it follows these historical events:

The steep rise in costs from 1941 to 1952; the collapse of 1930-32; the reversal in 1933 that preceded the sharp cost rise of 1933-34; the five years of surface stability from 1925-30, with its warning of the 1930-32 collapse. Minor movements are also clearly indicated, notably the reversals of 1935-36 and 1938-39; the loss of momentum in 1944-45, and pauses in the uptrend in 1949, and 1951-52.

Here's how Petit reads his signs of those events:

1. The postwar rise was signalled clearly by the breakaway gaps in 1941, 1946 and 1950, which warned of the increasing momentum in prospect for cost increases. The strength of the actual movement was confirmed as the chart blocks expanded and created a steepening trend line.

Most vivid showing of the extremely sharp rise postwar is contained in the blocks as plotted between 1946 and the first quarter of 1952. The rapid ascension of the blocks on the chart due to abnormal quarterly changes, and the concurrent extensive gaps between the blocks showed clearly that the more-or-less orderly rise up to 1946 had lost all of its



orderly features. The indication of heavy inflation is clear. In fact, from the beginning of 1941 up to the second quarter of 1949 the chart gives no indication of an end to the rise in construction costs. Had he been using Petit's system, no contractor could have entered a bid on a guaranteed price basis, without full realization that he faced a prospect of rapidly rising costs.

2. Conversely, the breakaway gaps shown in 1931 heralded increasing momentum that would culminate in the 1931-32 collapse. Expanding (downward) blocks and steeper trend lines confirmed the speedy downtrend.

As early as 1930, the start of the downtrend can be seen, following a dead level movement through the second quarter of 1930. This downtrend of course continued through mid-1932, when the blocks began to constrict, the gaps to close, and the trend line to penetrate the blocks to mark the end of the trend.

The chart traces the upward reversal to the second and third quarters of 1933, when block tops rise, gaps appear and the reversal is confirmed.

• **Present conditions**—In the 12-year rise between 1940 and the present, the momentum has slowed several times—first in 1944 when the trend line was penetrated and the blocks constricted; again in 1949 and in 1951-52.

The 1951-52 slowdown or pause in the uptrend is still in progress.

So far, Mr. Petit's curve gives no sure indication as to whether this is a prelude to a period of stability, or a base for a new climb. The chart does show that the cost rise trend line attributed to the start of the Korean action was pierced in the second half of 1951—an action confirmed by the closing gaps and constricting blocks.

It would seem, however, that a reversal in cost trends cannot be anticipated, as long as the block tops continue to be successively higher.

Although the basic data curve is still rising, the trend has lost some of its upward power as indicated by the moving average, even though the actual index reached a new high this month.

However, pending the appearance of evidence more vital to the solution of trend direction, the upward trend must be considered still to be in force, says the insurance engineer.

• **Warnings**—Summing up actions of his chart, Mr. Petit repeats a number of warnings for prospective users of the method:

1. All three elements—expanding or contracting blocks, appearance of gaps, pierced trend lines—must be in agreement to confirm major changes.

2. Waiting out such confirmation may take patience, but premature conclusions can be dangerous. When the blocks, gaps, trend lines appear to be moving indecisively, very little can be lost by awaiting the appearance of better evidence.

A price trend—once begun—does not reverse itself suddenly. Due to its peculiar momentum, such a trend proceeds in the same direction for many months—even years, the insurance company engineer adds.

The Petit Theory

This 3-way trend recognition system based on the ENR Construction Cost Index should add a new dimension to the hazardous art of predicting the movement of construction costs.

Its originator is George H. Petit. He graduated from the Massachusetts Institute of Technology, worked with Turner Construction Company, W. J. Barney Construction Corporation, and other contracting and engineering firms, then as a branch office manager of a member firm of the New York Stock Exchange. He is now a supervising engineer, Travelers Insurance Company, Hartford, Conn.

Construction Cost Indexes are used to:

- **Decide when to go ahead with construction projects**
- **Activate escalation clauses:**
  - **in contracts**
  - **in rental agreements**
- **Evaluate bids**
- **Up-date engineer's cost estimates**
- **Demonstrate need of additional financing**
- **Time buying schedules for large projects**
- **Pace construction operations and schedule completion dates**
- **Adjust assessment values and tax structures**
- **Modernize rate structures**
- **Revalue property for fire insurance coverage**

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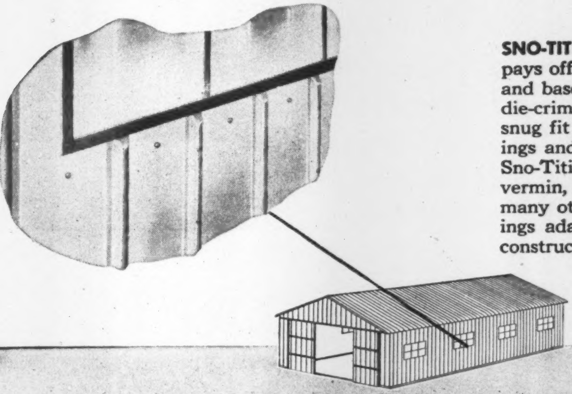

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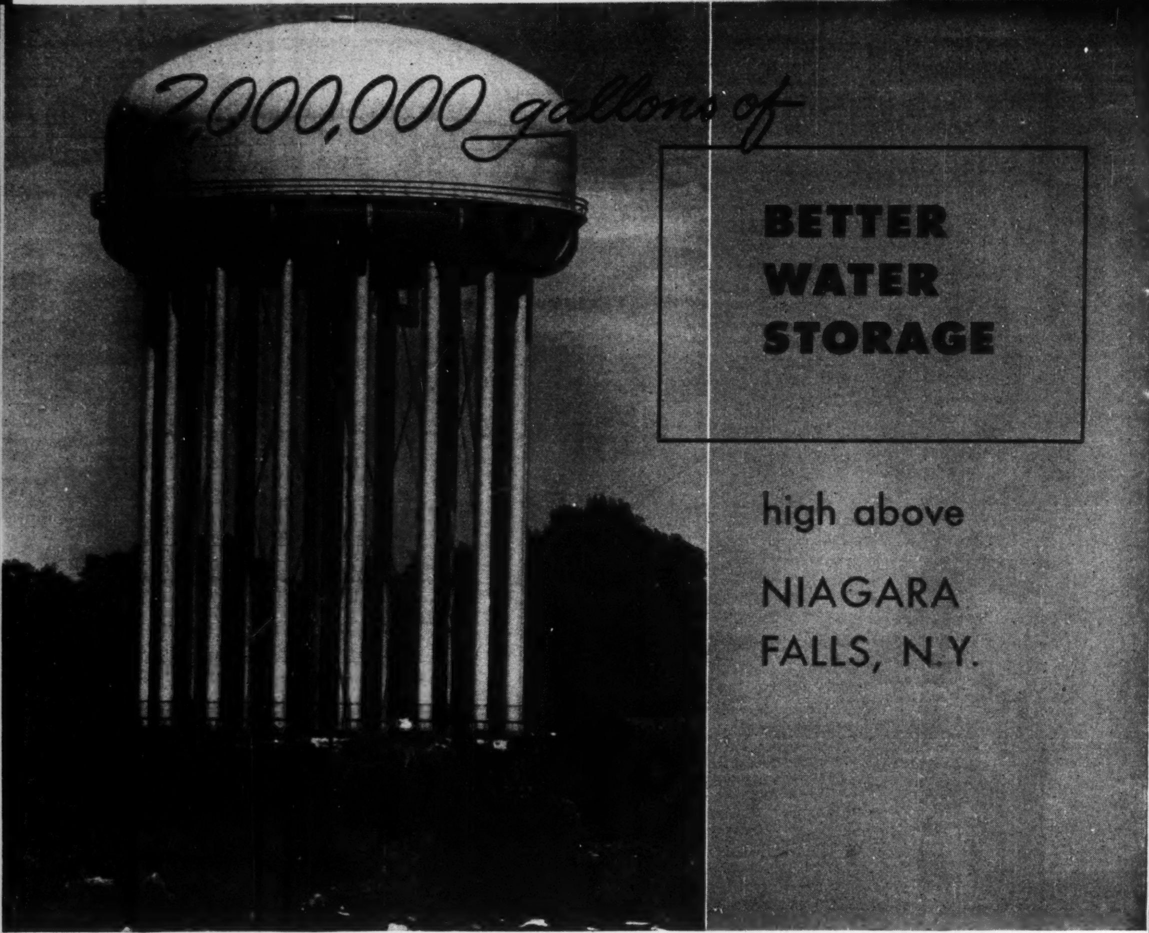

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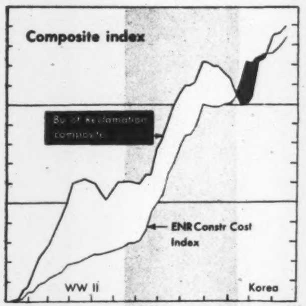
Irrigation and hydro-power construction cost indexes—Jan. 1940=1.0

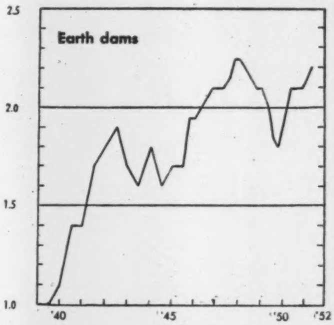
Bureau of Reclamation, Design and Construction Division, Denver, Colo.

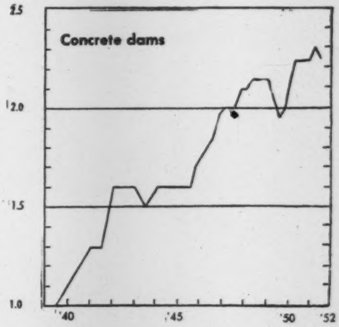
	1950		1951		1952		
	July	Oct	Apr	July	Jan	Apr	July
Composite Index	2.00	2.00	2.25	2.25	2.30	2.35	2.40
Dams, earth	1.85	1.75	2.10	2.10	2.10	2.15	2.20
Dams, concrete	1.95	2.00	2.25	2.25	2.25	2.30	2.25
Pumping plants, bldg & equip	2.00	2.05	2.25	2.30	2.40	2.40	2.45
struct, reinf concr, & imprv	2.25	2.30	2.45	2.50	2.55	2.60	2.65
equipment	1.70	1.85	2.05	2.10	2.20	2.20	2.20
pumps & prime movers	1.70	1.80	2.05	2.10	2.20	2.20	2.20
acces elec & misc equip	1.75	1.90	2.05	2.20	2.20	2.20	2.20
discharge pipes	2.10	2.25	2.45	2.50	2.55	2.55	2.60
Canals	2.15	1.95	2.20	2.30	2.40	2.45	2.50
Conduits, tunnels, free flow, concrlined	2.20	2.30	2.40	2.35	2.45	2.50	2.60
Laterals and drains	2.35	2.35	2.45	2.50	2.65	2.65	2.70

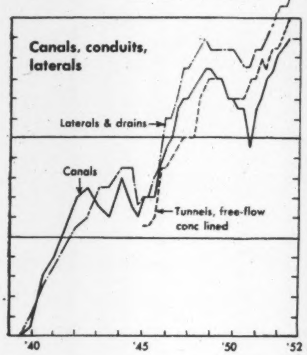
	1950		1951		1952		
	July	Oct	Apr	July	Jan	Apr	July
Primary roads	1.95	1.95	2.15	2.25	2.30	2.35	2.35
Secondary roads, unsurf	1.80	1.75	2.00	2.10	2.25	2.25	2.25
Bridges	2.05	2.10	2.40	2.45	2.45	2.45	2.50
Powerplants, hydro, bldg & equip	1.90	1.95	2.20	2.20	2.30	2.30	2.35
structs, reinf concr, imprv	2.20	2.25	2.40	2.45	2.55	2.60	2.65
equipment	1.75	1.85	2.10	2.10	2.20	2.20	2.20
turbines & generators	1.70	1.80	2.10	2.10	2.20	2.25	2.20
acces elect equip	1.75	1.85	2.10	2.10	2.20	2.20	2.20
misc equip	1.90	1.95	2.15	2.20	2.20	2.20	2.20
penstocks	2.10	2.25	2.45	2.50	2.55	2.55	2.60
Transm switchyards & substations	1.70	1.85	2.20	2.20	2.20	2.20	2.25
Transmission lines, wood pole	1.80	1.80	2.10	2.20	2.25	2.25	2.30
Transmission lines, steel tower	1.75	1.80	2.15	2.15	2.15	2.15	2.15
Permanent genl property, bldgs	2.15	2.40	2.60	2.60	2.60	2.60	2.60

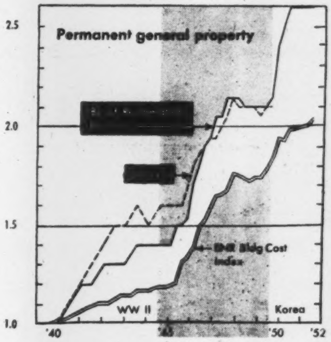
Based on combined costs of material and labor furnished by the contractor, and material and labor furnished by the government on B of R projects in 17 western states and Alaska.

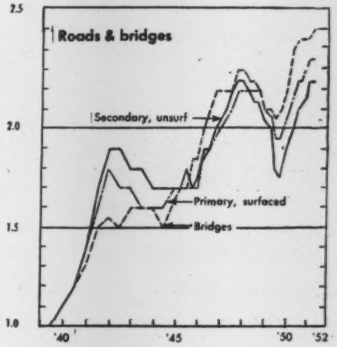


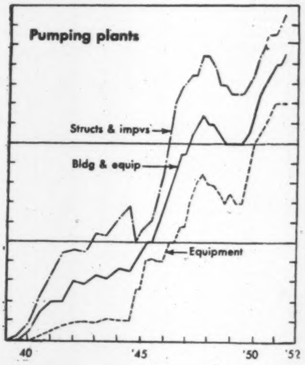


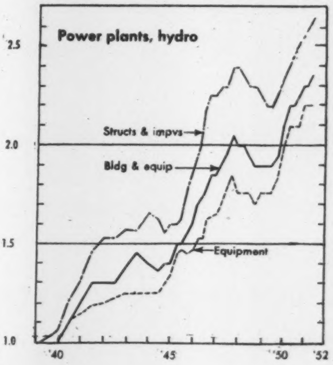


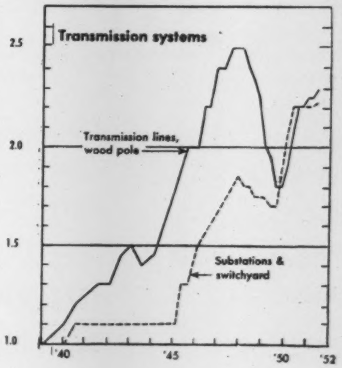


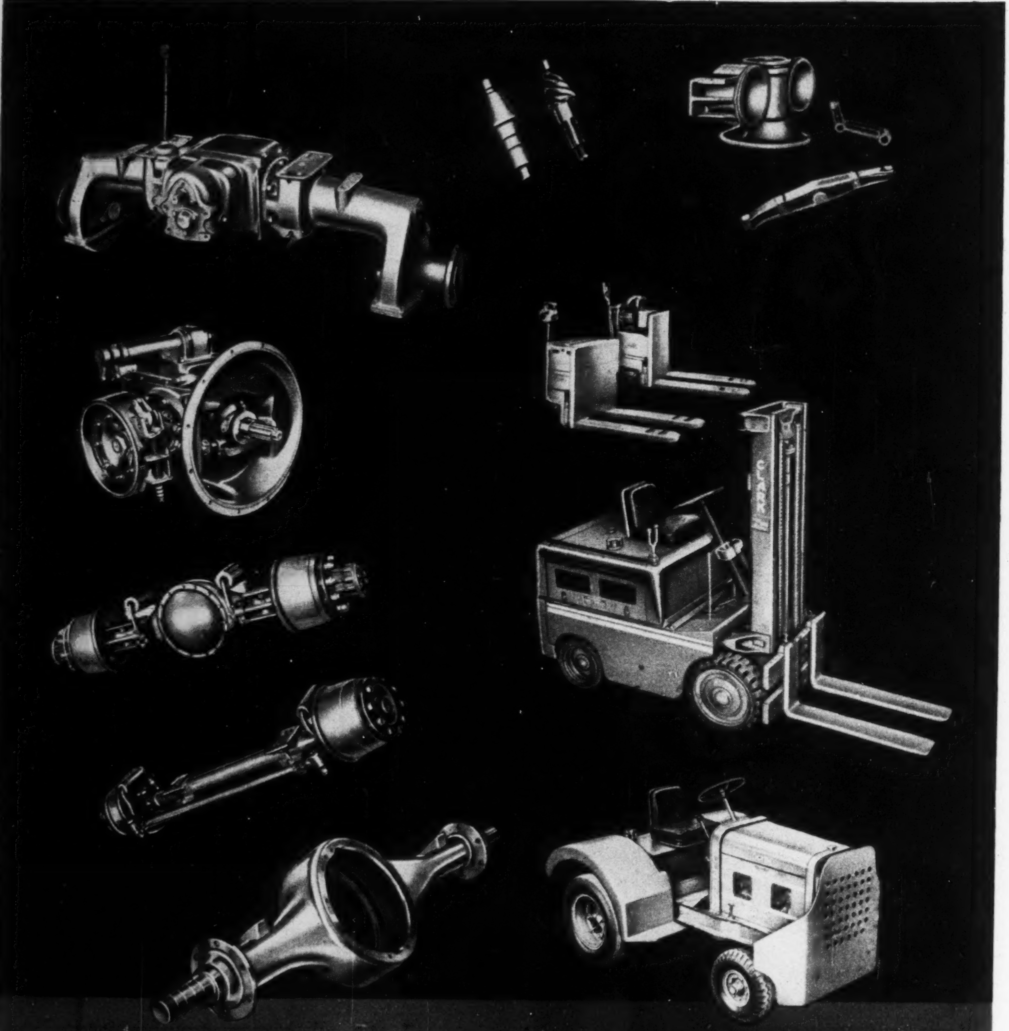












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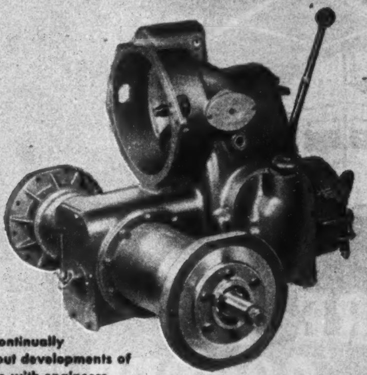

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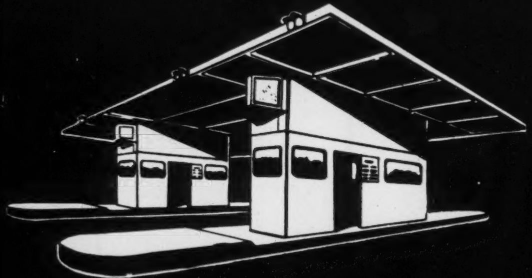

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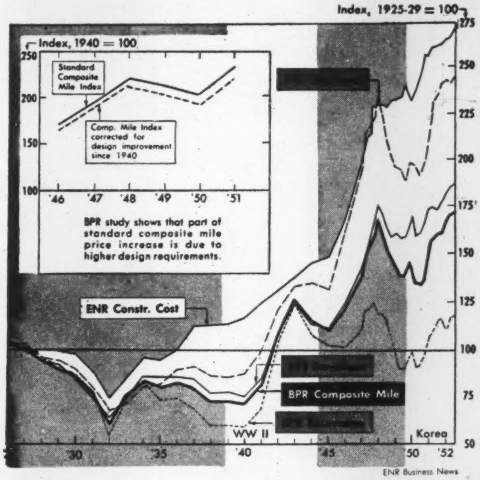


ENR Business News

Highway prices up 23% since Korea

The highest highway bids on record pushed the BPR composite mile price index to a new peak in the first half of 1952. This means also a 23% rise since Korea. Excavation is up 31% since the spring of 1950 but is still below bids in 1923, 1924, 1943 and 1948. Structural steel is up 31% since early 1950, reinforcing steel is up 27% even before the July, 1952 steel price rise. Structural concrete is up 28% and surfacing, 18%.

The highly mechanized excavation bids have gone up only 18.5% since 1925-29, while the less completely mechanized structures bids average 145.5% more. In between, also highly mechanized, surfacing is up 88%. The composite mile index is up 71.8% since that stretch of stable costs in the twenties.

Highway price index— composite standard mile

U. S. Bureau of Public Roads, 1925-29 = 100

Year	Excavation[1] 17,491 cy* Bid price[3]	Excavation[1] 17,491 cy* Sub-index	Surfacing[2] 3,726 sy* Bid price[3]	Surfacing[2] 3,726 sy* Sub-index	Structures: Reinf. steel 16,000* lb. Bid price[3]	Structures: Struct. steel 4,325* lb. Bid price[3]	Structures: Struct. concr. 68* cy Bid price[3]	Structures: Comb. Sub-index	Composite mile index
Base '25-29..	$0.35†	100.0	$2.22†	100.0	$0.052†	$0.067†	$22.15†	100.0	100.0
1926.....	.36	103.7	2.29	103.1	.053	.074	22.76	103.7	103.4
1932.....	.18	55.0	1.44	64.8	.034	.046	15.33	68.0	61.0
1939.....	.21	59.8	1.73	77.8	.044	.059	19.13	85.9	72.6
1942.....	.37	105.5	2.44	109.7	.065	.090	26.16	122.3	109.9
1945.....	.36	102.6	2.48	111.8	.062	.077	31.62	132.5	111.7
1948.....	.43	122.5	3.63	163.8	.108	.158	51.00	223.9	158.2
1949.....	.39	111.1	3.67	165.4	.104	.146	47.36	210.3	152.4
1Q.....	.32	91.2	3.54	159.6	.096	.133	44.96	197.0	140.7
2Q.....	.32	91.2	3.55	160.1	.096	.133	42.61	191.0	140.0
1950.....	.34	96.8	3.66	164.9	.100	.139	44.82	199.4	145.7
3Q.....	.34	96.9	3.68	165.9	.100	.137	44.66	199.4	146.2
4Q.....	.38	107.7	3.86	174.0	.106	.154	46.25	210.0	155.7
1Q.....	.38	109.1	3.88	174.9	.116	.180	50.12	230.4	159.7
2Q.....	.40	114.5	3.86	174.0	.119	.170	51.45	234.0	161.8
1951.....	.40	113.0	4.11	177.0	.120	.180	52.07	237.8	163.3
3Q.....	.41	116.8	4.06	175.8	.122	.182	53.21	242.5	164.8
4Q.....	.39	111.4	3.93	183.1	.123	.187	53.51	244.3	166.7
1952									
1Q.....	.41	116.0	4.11	185.3	.123	.184	52.97	242.5	169.1
2Q.....	.42	118.5	4.17	188.0	.122	.175	54.80	245.5	171.8

*[1] Common excav. plus other excav. items expressed as equivalent common excav. *[2] Portland-cmt. concr. plus other surfacing expressed as equivalent portland.-cmt. concr. *[3] Calculated to one more decimal place than shown in this table. ** Fixed quantities used for establishing composite mile for price trend. *† Prices used for establishing composite mile index base.

Highway price index and average contract prices

Division of Highways, State of California—1940 = 100

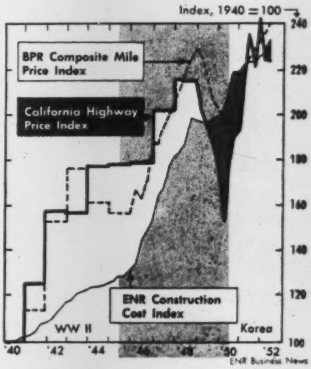
Year	Roadway excavation per cy	Crusher run base per t	Plant mix surface per t	Asphalt concrete pave. per t	PCC pavement per cy	PCC structures, per cy	Bar reinf steel per lb	Structural steel per lb	Hwy. constr price index
1940*..............	$0.22	$1.54	$2.19	$2.97	$7.68	$18.33	$0.040	$0.083	100.0
1941*..............	0.26	2.31	2.84	3.18	7.54	23.31	0.053	0.107	125.0
1942*..............	0.35	2.81	4.02	4.16	9.62	29.48	0.073	0.103	157.5
1943*..............	0.42	2.26	3.71	4.76	11.48	31.76	0.059	0.080	156.4
1944*..............	0.50	2.45	4.10	4.50	10.46	31.99	0.054	0.132	177.8
1945*..............	0.51	2.42	4.20	4.88	10.90	37.20	0.059	0.102	179.5
'46, 1 Half**.......	0.41	2.31	4.00	4.54	9.85	37.38	0.060	0.099	166.1
'46, 2 Half**.......	0.39	2.27	4.12	5.04	12.39	49.84	0.079	0.142	193.2
'47, 1 Half**.......	0.48	2.62	4.52	6.46	12.41	47.03	0.080	0.133	202.5
'47, 2 Half*........	0.54	2.39	4.02	6.48	11.58	50.15	0.089	0.123	204.1
'48, 1 Half*........	0.56	2.45	4.42	4.91	13.37	49.51	0.094	0.145	216.1
'48, 2 Half*........	0.52	2.64	4.80	7.00	14.01	49.08	0.103	0.131	216.4
'49 1 Q*...........	0.49	2.48	4.54	5.70	11.84	48.11	0.089	0.113	200.7
'49 2 Q*...........	0.43	2.91	4.63	4.06	11.74	48.63	0.083	0.110	195.9
'49 3 Q*...........	0.41	2.40	5.05	4.60	11.53	45.35	0.080	0.093	187.8
'49 4 Q*...........	0.43	2.55	3.78	3.50	12.66	44.54	0.078	0.092	178.0
'50 1 Q*...........	0.34	2.22	3.65	3.74	......	40.15	0.077	0.081	160.0
'50 2 Q*...........	0.40	2.13	4.48	3.74	10.86	43.03	0.080	0.105	180.2
'50 3 Q*...........	0.41	2.32	4.25	5.50	10.91	44.34	0.098	0.131	189.8
'50 4 Q*...........	0.42	2.81	4.64	4.61	12.55	43.18	0.098	0.120	194.4
'51 1 Q*...........	0.45	3.07	4.06	5.22	11.71	46.38	0.103	0.206	215.3
'51 2 Q*...........	0.63	3.88	4.56	4.63	12.93	51.50	0.105	0.166	238.8
'51 3 Q*...........	0.56	2.88	4.59	3.90	12.41	46.14	0.107	0.165	221.9
'51 4 Q*...........	0.66	2.91	5.66	4.89	12.71	49.38	0.105	0.169	245.4
'521 Q*...........	0.56	3.25	4.88	4.77	14.25	47.46	0.094	0.152	224.8
'52 2 Q*...........	0.53	3.19	5.29	4.13	14.20	49.12	0.091	1.143	224.4

* All projects. ** Federal-aid projects only.

CALIFORNIA'S highway construction price index is based on the average contract prices for the eight principal classes of construction shown in the accompanying table. The index is weighted each year according to the actual quantities of each of these contract items. The base is 1940 = 100, 1940 quantities multiplied by 1940 average contract prices. The price index for each period is computed by extending total quantities. Richard H. Wilson, Assistant state highway engineer, H. C. McCarty, office engineer.

California reports a 40% rise in highway bid prices since the exceptional lows of 1950, but slightly less increase since 1940 than are shown by the BPR Composite Mile and the ENR Construction cost indexes. Excavation is up 56% since its 1950 low; prices have shown wide fluctuation.

Competition averaged 8 bidders in November, 1950, its peak, then declined to 3.2 by June, 1952, the lowest for the 2-year period. The largest jobs attracted the most bidders, an average of 7. The smallest jobs attracted the fewest bidders, an average of 4.5 for the 1951-52 fiscal year.



ENR Business News

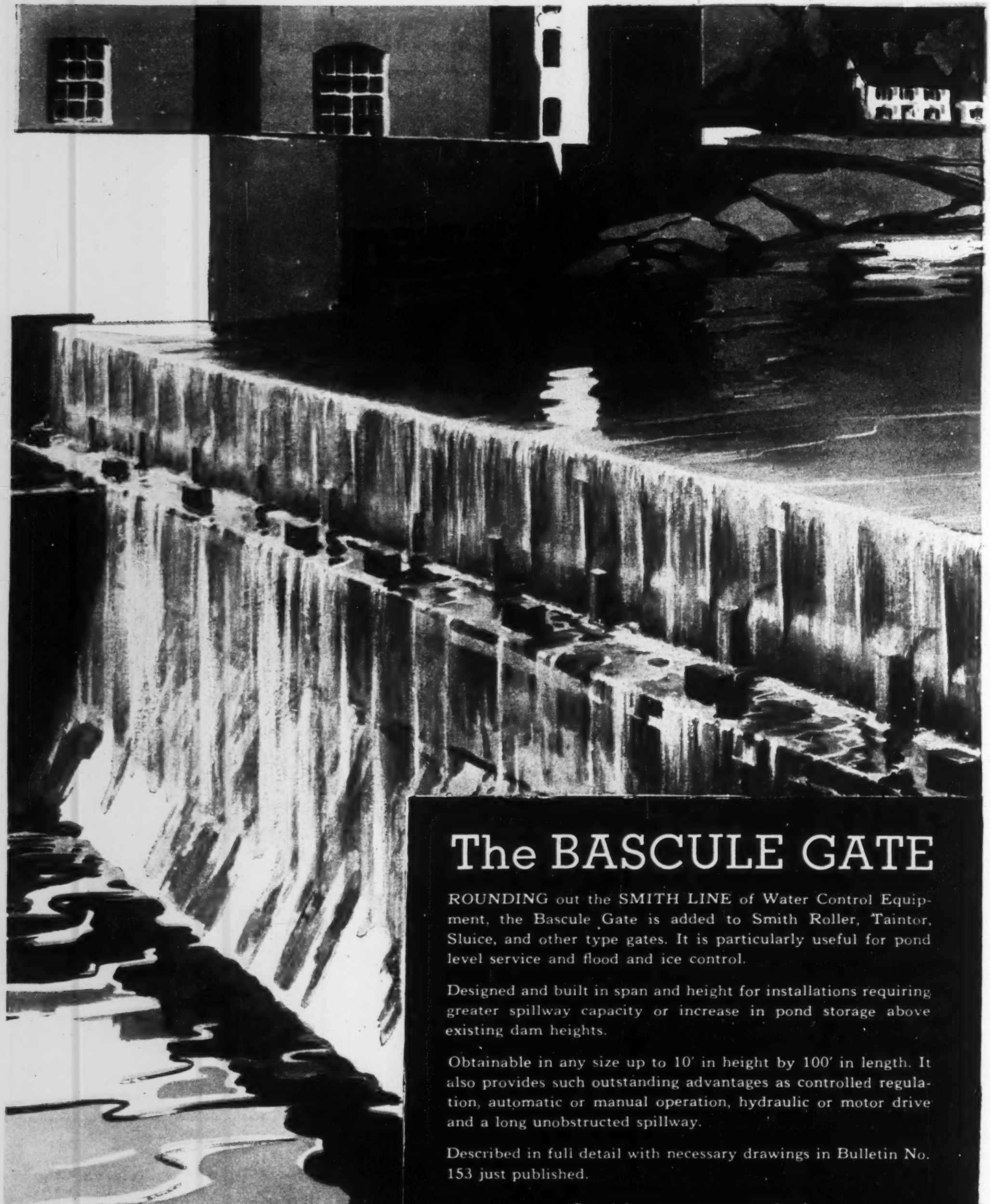
Competition for Jobs

Average number of bidders

By size of project in 1951-52	Number of projects	Number of bidders
Up to $50,000........................	159	4.5
$50,000 to $100,000..................	57	5.5
$100,000 to $250,000.................	83	5.6
$250,000 to $500,000.................	40	5.6
$500,000 to $1,000,000...............	20	6.7
Over $1,000,000......................	25	7.0
Aver. all projects...................	384	5.3

By months

Mo	'50	'51		'50	'51		'51	'52		'51	'52
July	4.3	4.9	Oct	4.4	6.2	Jan	7.6	5.5	Apr	6.0	4.7
Aug	4.0	5.6	Nov	8.0	6.7	Feb	6.4	5.3	May	4.5	3.7
Sept	4.6	5.8	Dec	7.3	5.7	Mar	6.9	4.8	June	4.8	3.2
Q Av	4.3	5.4		6.6	6.3		7.0	5.2		5.1	3.9



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Obtainable in any size up to 10′ in height by 100′ in length. It also provides such outstanding advantages as controlled regulation, automatic or manual operation, hydraulic or motor drive and a long unobstructed spillway.

Described in full detail with necessary drawings in Bulletin No. 153 just published.

Send for your copy today!

S. MORGAN SMITH CO.
YORK, PENNA.

Construction materials prices in 20 cities

Market quotations on construction materials as reported to Engineering News-Record

	CEMENT, Bulk per bbl CL lots, fob city Incl Dealer Comn. 1951 Low	High-Dec.	SAND, per ton Truck lots or over fob city 1951 Low	High-Dec.	CONCRETE, READY-MIXED 1:2:4 over 50 cy per cy delivered 1951 Low	High-Dec.	BRICK, CLAY BACKING per M quantity delivered 1951 Low	High-Dec.	STRUCTURAL CLAY TILE Partition, Scored, 3 x 12 x 12 per M, 2000 pieces or over delivered 1951 Low	High-Dec.
Average	3.13	3.17	2.07	2.10	10.85	11.02	30.27	31.27[u]	135.62	149.66
Atlanta	3.35	3.45	1.75	1.75	11.00	11.50	26.75	27.78	......	......
Baltimore	3.34	3.40	2.00[e]	2.00[e]	10.80	10.80	36.00	37.00	175.00	180.00
Birmingham	2.68	2.68	1.84	1.94	7.75	7.85	20.00	23.50	97.50[x]	118.00[y]
Boston	3.61	3.69	2.50	2.50	10.45[j]	11.50[j]	33.50[v]	33.75[v]	149.00[x]	196.00[x]
Chicago	2.84	2.99	3.40[f]	3.40[f]	11.50	12.00	21.00	21.00	135.00	135.00
Cincinnati	3.18	3.18	2.05[eg]	2.05[eg]	10.95	11.45	34.00[v]	43.00[vw]	170.00[x]	185.00[x]
Cleveland	2.90	2.90	1.55	1.65	13.00[k]	13.00[k]	32.00	32.00	118.00	149.00
Dallas	2.65	2.65	1.84	1.84	9.30	9.30	18.75	19.75	......	......
Denver	3.64	3.64	1.15	1.20	9.75	10.10	34.00	34.00	......	......
Detroit	2.98	2.98	3.50[ef]	3.75[ef]	10.50	10.55	33.50[v]	34.00[v]	117.08	127.75
Kansas City	3.03	3.03	1.50	1.50	10.95[l]	11.20[l]	26.00	26.00	115.00	115.50
Los Angeles	3.40[a]	3.52[a]	1.95	1.95	10.15[m]	10.80[mn]	20.00[x]	21.00[x]	......	......
Minneapolis	2.37[b]	3.37[b]	1.45[e]	1.35[eh]	11.25	11.75	32.00[v]	32.00[v]	171.50[x]	171.50[x]
New Orleans	2.80	2.90	1.82	1.82	12.90	12.90	29.00	31.00	160.00	170.00
New York	3.44	3.50	1.60[fi]	1.60[fi]	11.30[o]	11.65[op]	35.00	38.50	121.60[z]	138.70[z]
Philadelphia	3.12	3.22	2.05[e]	2.15[e]	11.15	11.50	29.00	29.00	126.30	126.30
Pittsburgh	3.04	3.04	2.10[c]	2.10[c]	11.00	11.00	32.00	32.00	112.00	112.00
St. Louis	2.92[c]	3.03[c]	2.45[c]	2.50[c]	10.40	10.75	40.00	40.00	120.00[aa]	138.00[aa]
San Francisco	2.95	2.99[d]	1.96	1.98	10.30[r]	10.75[rs]	33.00	37.00	132.00[xbb]	156.85[xbb]
Seattle	3.25[a]	3.25[a]	3.00[cef]	3.00[cef]	10.95[j]	10.95[j]	32.00	39.00	150.00[aa]	175.00[aa]
Montreal	2.51[a]	2.51[a]	1.90	2.00	9.05	10.50[t]	26.50	26.50	143.00[x]	150.00[x]

[a] subj to 10¢ disc. **[b]** CL price, dealers sell only LCL **[c]** 2% cash disc. **[d]** Dec. $2.95 **[e]** delivered **[f]** per cy **[g]** 5 tons or over **[h]** Dec. $1.35 **[i]** barge lots asd **[j]** 50¢ cash disc. **[k]** 7–9 mi zone **[l]** 25 cy plus **[m]** 1:2¼:4 mix **[n]** Dec. $10.43 **[o]** 5 cy or more deliv. Man. **[p]** Dec. $11.55 **[r]** 10–100 cy **[s]** Dec. $10.30 **[t]** Dec. $9.95 **[u]** Dec. $31.11 **[v]** truck loads **[w]** Dec. :34.00 **[x]** fob yard **[y]** smooth **[z]** fob trucks, job site NYC **[aa]** truck delivery **[bb]** fob Stockton.

LUMBER, No. 2 Common or better, 2 x 4 s4s

ENR 20-Cities	Short Leaf Yellow Pine 1951 Jan.	Low-Mo.		High-Mo.		Dec.	Douglas Fir 1951 Jan.	Low-Mo.		High-Mo.		Dec.
Average	90.51	90.02	Aug	95.42	May	91.73	104.32	104.32	Jan	111.59	May	106.79
Atlanta[a]	67.50	67.00	Jun	69.50	Apr	67.00	......	......		......		......
Baltimore[b]	80.92	70.00	Aug	85.00	Dec	85.00	80.92	80.92	Jan	112.50	May	104.50
Birmingham[a]	65.00	65.00	Jan	70.00	Mar	70.00	75.00	75.00		75.00		75.00
Boston[b]	85.00[i]	85.00[i]	Jan	99.50[i]	Sep	97.00[i]	100.00[c]	100.00[c]	Jan	115.00[c]	Mar	107.50[c]
Chicago[d]	91.00	91.00	Jan	95.00	Feb	92.00	102.00	98.00	Jul	115.00	Feb	100.00
Cincinnati[b]	85.00	84.00	Jul	93.50	Feb	84.00	105.00	105.00	Jan	125.50	Mar	114.00
Cleveland[d]	87.50	77.00	Jul	100.00	Apr	79.00	92.50	92.00	Jul	108.00	Jun	100.00
Dallas[e]	69.00	69.00		69.00		69.00	......	......		......		......
Denver	......	......		......		......	106.00[b]	106.00[b]	Jan	133.00[b]	May	125.00[b]
Detroit[e]	86.00	86.00	Jan	105.00	Apr	100.00	100.00	100.00	Jan	105.75	Sep	105.75
Kansas City[b]	120.00	120.00	Jan	125.00	May	120.00	120.00	120.00	Jan	125.00	May	120.00
Los Angeles	......	......		......		......	91.00[f]	88.00[f]	Aug	108.00[f]	Feb	98.00[f]
Minneapolis	......	......		......		......	130.00[g]	130.00[g]	Jan	135.00[g]	Oct	135.00[g]
New Orleans[e]	95.00	92.00	Sep	97.00	May	92.00	109.25	102.50	Sep	113.00	Mar	103.25
New York[h]	105.00	97.50	Aug	110.00	Feb	102.50	115.00	115.00	Jan	122.50	Feb	122.50
Philadelphia[f]	122.00	122.00		122.00		122.00	135.00	135.00		135.00		135.00
Pittsburgh[a]	87.50	87.50	Jan	92.50	Oct	92.50	100.00	100.00	Jan	105.00	Oct	105.00
St. Louis[g]	111.25	98.25	Aug	116.25	Mar	104.00	129.75	117.25	Sep	138.00	Feb	122.75
San Francisco[a]	......	......		......		......	92.00[a]	69.00[a]	Aug	92.00[a]	Jan	72.00[a]
Seattle[a]	......	......		......		......	82.50[a]	77.00[a]	Dec	82.50[a]	Jan	77.00[a]
Montreal	93.00[i]	93.00[i]	Jan	95.00[i]	Jul	95.00[i]	165.00	165.00	Jan	175.00	Feb	175.00

[a] fob mill **[b]** fob cty CL out of yard **[c]** asd **[d]** fob city CL direct mill **[e]** deliv. to contr. **[f]** retail LCL at yard **[g]** retail LCL deliv **[h]** deliv truck lots **[i]** spruce

Construction materials price trends

In addition to the wholesale price indexes for building materials shown here, the materials cost component of the ENR cost indexes is reported in curves on the folded chart inserts, once compared with wage components on the Construction and Building Cost Index chart and again compared with BLS wholesale price index for building materials and for all commodities on the Men. Materials & Money insert. The ENR materials cost trend is based on price movements of cement, lumber, steel. The BLS wholesale price (primary markets) index starts a new series this year.

Wholesale price index

U. S. Bu. of Labor Statistics, 1926 = 100

BUILDING MATERIALS—monthly Index

Components	1929	1932	1939	1946	1949	1950	1951
All	95.4	71.4	90.5	132.2	193.4	206.0	225.5
Brick and tile	94.3	77.3	91.4	123.0	161.7	168.2	179.9
Cement	91.8	77.2	91.3	104.1	133.8	136.6	147.2
Lumber	93.8	58.5	93.2	177.5	286.0	327.4	351.4
Paint	94.9	71.1	82.8	118.3	151.3	142.0	162.2
Plumb & heat	95.0	66.8	79.2	103.5	154.8	162.6	183.9
Struc. steel	98.1	80.9	107.3	118.5	179.3	192.6	204.3
Other	97.7	79.5	90.3	117.9	171.7	178.4	198.1

Discontinued Jan 1952

Building materials prices

ENR average yearly prices at New York, except steel

Year	Brick common per M	Cement per bbl	Lime per bbl	Pine per M ft bm	Steel shapes per cwt h
1874..	$7.41	$1.48R	$1.50a	$26.00d	.....
1890..	6.65	2.25R	.95a	21.75d	.....
1907..	6.16	1.55C	.95a	30.50d	1.75
1913..	6.75	1.18C	.915a	25.04e	1.50
1929..	11.71	2.23C	2.25b	64.50f	1.92
1932..	9.75	1.62C	2.25b	39.91f	1.56
1938..	13.10	2.12C	2.80b	59.33f	2.18
1939..	13.46	2.20C	2.80b	64.35f	2.10
1942..	14.17	2.20C	2.80b	85.61f	2.10
1947..	26.38	3.46C	24.34c	115.83g	2.61
1948..	30.33	4.05p	26.32c	114.38g	2.98
1949..	33.00	3.32p	26.80c	98.13g	3.25
1950..	33.50	3.52p	27.10c	131.88g	3.42
1951..	37.92	3.78p	31.00c	154.79g	3.65

• **BRICK**: wholesale, fob; • **CEMENT**: net, delivered **R** Rosendale, rest Portland **C** in cloth bags delivered (1949—$4.23) **p** in paper bags, fob city in carload lots; • **LIME**: **a** common lump, wholesale, fob, 180 lb., net, **b** 280 lb., **c** common hydrated, delivered, per ton (40 bags of 50 lb. ea) no longer quoted per bl.; • **LUMBER**: No. 1 common, rough, **d** 1-in. yellow pine, wholesale at dock, **e** 3-in. LLYP, **f** 3x12 LLYP from Lumber Trade Jl., **g** 3x12 SLYP (LLYP out of market); • **STEEL**: h fob Pittsburgh.

Wholesale price index, building materials

Bureau of Labor Statistics, 1947-49 = 100

Month	1947♯	1948♯	1949♯	1950♯	1951♯	1952*
Year	94.0	104.0	102.0	109.5	119.6	.....
Jan	88.7	100.7	105.4	102.1	120.2	117.8
Feb	89.9	101.2	104.9	103.2	120.7	117.9
Mar	91.5	101.8	104.4	104.1	120.8	118.0
Apr	92.8	102.0	103.4	104.7	120.9	118.2
May	93.0	102.5	102.4	106.3	120.7	118.1
June	92.8	103.1	101.5	107.5	120.0	117.8
July	93.4	104.5	100.3	109.1	119.4	118.0p
Aug	94.9	106.7	99.7	112.0	118.9	.....
Sept	96.2	107.0	99.9	114.4	118.7	.....
Oct	97.1	106.6	100.2	115.8	118.7	.....
Nov	98.3	106.3	100.6	116.3	118.5	.....
Dec	99.2	105.9	101.2	118.3	118.0	.....

* Official beginning January, 1952 ♯ Unofficial—for official index for these years see the 1926 = 100 wholesale price index table also shown here p preliminary

Relative importance of 57 items in new building materials price index

Item and sub-item	Weight %
Paint & pnt materials	6.8
Pnt, water thinned	0.4
Varnish	0.3
Enamel	0.8
Paint, inside	1.9
outside	2.5
porch & deck	0.3
roof & barn	0.3
Linseed oil	0.3
Turpentine	a
Lumber & wood prod	38.6
Douglas fir	8.2
Southern pine	9.3
Other softwood	7.1
Oak flooring	3.5
Oak, red	1.5
Maple Flooring	0.7
Poplar	0.4
Beech	0.2
Millwork	5.9
Softwood plywood	1.3
Hardwood plywood	0.5
Building paper	1.6
Metals & met prod	29.5
Structural shapes	1.4
Bars concr reinf	0.5
Galvanized sheets	0.9
Pipe, black steel	1.4
galvanized	1.2
Nails, wire	1.2
Cast iron soil pipe	0.7
Aluminum sheets	1.1
Copper water tubing	0.3
Building wire	1.4
Non-met sheathd cable	0.8
Cabinet hinge	0.4
Door lock set	1.0
Butts	0.5
Plumbing equipment	3.4
Heating equipment	9.5
Metal doors	3.3
Basement oil tanks	0.2
Wood screws	a
Screening, galv	0.1
bronze	0.2
Machy & motive prod	2.9
Elevators & escalators	0.8
Fans & blowers	0.4
Incandescent lamps	1.7
Furnitr & hshld durabl	1.7
Kitchen cabinet, metal	0.7
Linoleum, inlaid	0.6
Asphalt floor tile	0.3
Rubber floor tile	0.1
Non-metal minerals	19.2
Plate glass	0.8
Window glass	0.7
Concrete ingredients	6.3
Concrete products	3.1
Struct clay products	2.5
Gypsum products	1.2
Prepared asph roofing	3.1
Other non-met minerals	1.5
Total	100.0

a less than 0.00

EXPLOSION RIPS HYDRO-ELECTRIC PLANT IN BRAZIL: 7 INJURED

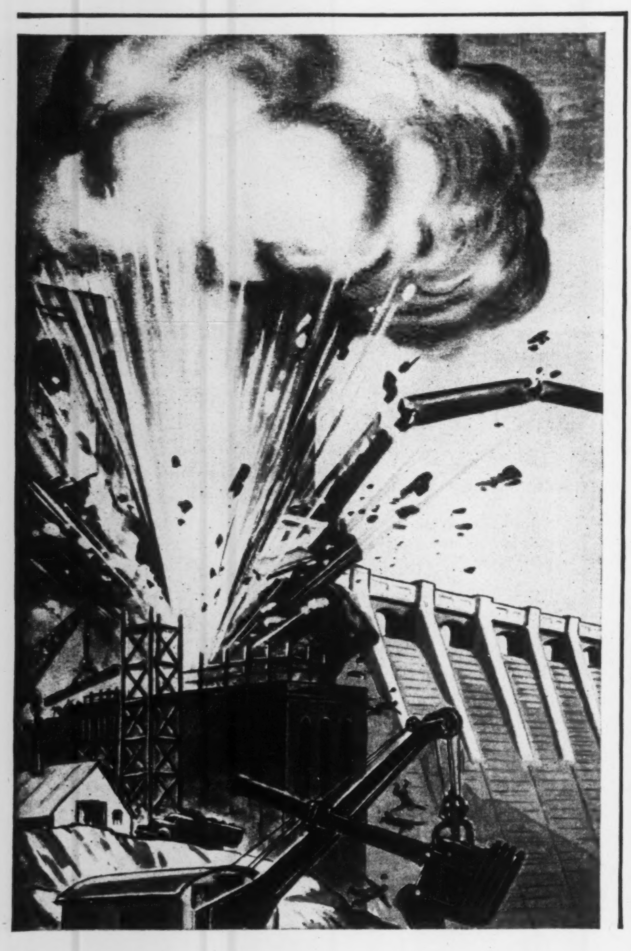
A vast construction project nearing completion by an American construction company, today was virtually destroyed by an unexplained explosion. Four American technicians and several natives were seriously injured.

Accidents like this do happen—frequently. When they do, contractors and owners face serious financial loss—perhaps ruin.

That is why it is good business to protect your foreign interests, your property, your equipment and your liability, with sound insurance through the *American Foreign Insurance Association.*

AFIA knows the complex insurance laws, regulations and currency problems in all countries. Its years of specialized experience in the foreign insurance field, combined with the great financial strength of its 24 outstanding American capital stock insurance member companies are your assurances of insurance protection that is unsurpassed.

Ask your agent or broker to get full information from AFIA on any specific risk.



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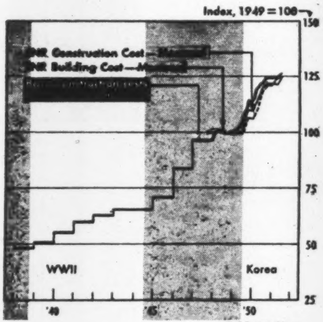
Construction around the world

NORTH AMERICA & WEST INDIES

• **Anchorage, Alaska:** Wage rates for both common and skilled labor are up 20¢ per hour from Sept. 1951. Materials prices show little change.



ENR Business News

CANADIAN construction cost indexes

• **Montreal, Canada:** New wage agreements call for increases of 10-15¢ per hour. Union demands averaged 25-40¢ up to $1 an hour despite lower living costs.

Construction costs on a national level were reported relatively stable in the first half of this year, but there have been recent price declines in lumber and some electrical products. The outlook is for higher labor costs to outbalance lower materials prices, the result, a net rise in construction costs.

• **Mexico City, Mexico:** Common labor is plentiful and there is a fair supply of semi-skilled workers. A shortage of skilled labor requires most contractors to train their own. There is a fair supply of lumber, reinforcing steel and gravel, but structural steel and occasionally cement are scarce. A record production of cement has not kept pace with the needs of a heavy construction program, including a large volume of public works. A temporary black market for cement flourishes but production is expected to catch up with demand soon.

Money is reported to be very tight but so far has not affected the record volume of new construction largely fed by a $450-million government program. Insurance companies have been supplying the money for a large part of construction in Mexico.

Construction costs have been rising by about 10% per year and contractors are currently refusing to make firm bids unless they can buy and warehouse materials in advance or are permitted to renegotiate contracts.

• **San Juan, Puerto Rico:** Skilled labor in many trades is scarce but unskilled labor is plentiful. Materials are in good supply and plenty of money is available for financing. Contractors bringing equipment into Puerto Rico pay 10% tax on tractors and trucks, 5% on other heavy equipment, and 20% on autos. They must keep records according to OPS regulations.

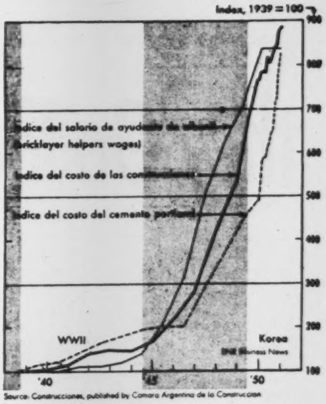
SOUTH AMERICA

• **Buenos Aires, Argentina:** Construction costs as measured by the index of Camara Argentina de la Construcción (see chart) increased nearly 16% in 1951. (See ENR Nov. 1, 1951, p. 125 for details of computing this index.) Higher living costs have led to wage increases in 1952.

• **Caracas, Venezuela:** Supply and quality of workers varies in different parts of the country. Materials are plentiful but depend upon foreign markets since most are imported. Money is available for new construction. Contracts and materials are taxed but fees vary widely among the different states.

• **Rio de Janeiro, Brazil:** May construction costs as measured by the index of the

Continued on following page



Source: Construcciones, published by Camara Argentina de la Construccion

BUENOS AIRES building cost index

Construction wages outside the United States

Rates per hour in national currency in Sept 1951 and June 1952

North America

CITY and COUNTRY	Exch rate June 52 /$1 US	Common labor Bldgs 6/52	Common labor Bldgs 9/51	Common labor Hvy constr 6/52	Common labor Hvy constr 9/51	Carpenters 6/52	Carpenters 9/51	Bricklayers 6/52	Bricklayers 9/51	Struct iron workers 6/52	Struct iron workers 9/51
Anchorage, Alaska...[a]	$1	2.935	2.735	2.935	2.735	3.34	3.14	4.07	3.87	3.615	3.415
Montreal, Canada...[ac]	$1	1.20	1.09	1.20	1.03	1.70	1.55	1.90	1.75	1.80	1.65
San Francisco, USA..[a]	$1	1.85	1.70	1.85	1.70	2.45[j]	2.45	3.25[dj]	3.25[d]	2.70[j]	2.70
New York City, USA.[a]	$1	1.90	1.90	1.90	1.90	3.09[dg]	3.09[dg]	3.548[df]	3.548[f]	3.348	3.348[e]
Mexico City, Mex..[ab]	8.65p.	0.83	0.75	0.83	0.75	2.20	1.88	2.20	1.88	2.20	1.25
Havana Cuba.......[a]	$1	0.51	0.50	0.62	0.62	0.82	0.82	0.82	0.82	0.82	0.82
San Juan, PR.......[a]	$1	0.35[i]	0.35[i]	0.65	0.65	0.80[h]	0.70[h]	1.00A	0.85	1.00B	0.80

[a] 8-hr day [b] Pd 7 days, work 6, rate per hr not adjusted for extra pay Contractor pays 1-3% payroll tax for social security [c] cost of living bonus incl [d] 7-hr day [e] 6-hr day [f] incl 3% welfare fund and 20¢ pension fund [g] incl 3% welfare fund [h] rate for good carpenters; min wage: $0.65/hr [i] min wage; common labor-bldgs actually pd. more by industry [j] negotiating Ranges: A 0.85–1.00 B 0.80–1.00

South America

CITY and COUNTRY	Exch rate June 52 /$1 US	Common labor Bldgs 6/52	Common labor Bldgs 9/51	Common labor Hvy constr 6/52	Common labor Hvy constr 9/51	Carpenters 6/52	Carpenters 9/51	Bricklayers 6/52	Bricklayers 9/51	Struct iron workers 6/52	Struct iron workers 9/51
Bogota, Colombia.....[ai]	2.50p.	0.50	0.52	0.50	0.62	0.75	1.00	0.75	0.78	1.00	1.00A
Rio de Jan, Braz......[a]	18.50cr.	5.5[c]	5.0[c]	7.5[b]	7.5[b]	11	10	11	10	12	11
Santiago Chile.......[ae]	120p.	11–12	11–12	12–14	12–14	20–22	20–22	15–18	15–18	16–18	15–17
Buenos Aires, Arg...[adfh]	14p.	35.47	25.50	35.47	25.50	45–55	32–35	40–42	32	.....	.....
Caracas, Venez......[agh]	3.35Bs.	10	10–12	12	10–14	21.50	26B	21.50	25C	21.50	24

[a] 8-hr day [b] Advanced labor (adjudante) [c] Common labor (servante) [d] 44-hr wk [e] 48-hr wk; rates incl extra 8-hrs pay for working min 46-hrs per wk Contractor pays 5% payroll tax and 7½% of payrolls for workers insurance [f] Add 8% to cover insurance, 70% for social charges [g] pd 7 days, work 6 get 15 day pd vacation annually [h] per day [i] govt source used for '51 data; pvt source for '52 Ranges: [A] 0.80–1.00p. [B] 21–50–26Bs [C] 21.50–25Bs

Europe

CITY and COUNTRY	Exch rate June 52 /$1 US	Common labor Bldgs 6/52	Common labor Bldgs 9/51	Common labor Hvy constr 6/52	Common labor Hvy constr 9/51	Carpenters 6/52	Carpenters 9/51	Bricklayers 6/52	Bricklayers 9/51	Struct iron workers 6/52	Struct iron workers 9/51
London, England...[ab]	-/7/2	-/3/½	-/2/8	-/3/½	-/2/8	-/3/6	-/3/1½	-/3/6	-/3/1½	-/3/4	-/3/-
Stockholm, Sweden..[j]	5.17kr	5–6	4–5.5	5–6	4–5.5	6.5–7.5	5.5–6.5	7–8	6–7	5–6	5–6
Madrid, Spain......[b]	10.95p.	2.75	2.75	2.75	2.75	3.85	3.85	3.85	3.85	3.85	3.85
Paris, France.......[a]	350fr	100[l]	92[e]	107[l]	96[e]	128[lm]	116[c]	128[lm]	116[e]	128[lm]	116[e]
Amsterdam, Nthlnds.[g]	3.80gld	1.068[d]	1.068[d]	1.140[e]	1.140[e]	1.261[f]	1.261[f]	1.242[f]	1.242[f]	1.158	1.158
Frankfort, Grmny...[ah]	4.20DM	1.61	1.52	1.78	1.68	1.89	1.79	1.89	1.79	1.89	1.79
Rome, Italy........[ai]	624.92lire	238.25	232.50	238.25	232.50	292.37	281.87	265.12	256.90	292.37	281.87

[a] 8-hr da [b] employer pays addl 95% of worker's pay to social insurance fund [c] minimum, add 50% for social charges [d] on no-tariff bldgs [e] cn tariff bldgs [f] aver tariff & no-tariff bldg [g] 8½-hr da [h] 48-hr wk [i] incl paid holidays and social chgs pd by contr Contractor pays 4% payroll tax [j] 8¾-hr da, 5¾-hr Sat [k] 44-hr wk [l] minimum, add 47% for social charges [m] some get 142 fr/hr due to shortage

Africa, Asia, and Australia

CITY and COUNTRY	Exch rate June 52 /$1 US	Common labor Bldgs 6/52	Common labor Bldgs 9/51	Common labor Hvy constr 6/52	Common labor Hvy constr 9/51	Carpenters 6/52	Carpenters 9/51	Bricklayers 6/52	Bricklayers 9/51	Struct iron workers[g] 6/52	Struct iron workers[g] 9/51
Cairo, Egypt.......[ab]	£E 0.35	0.30	0.30	0.65	0.65	1.00	1.00	1.05	1.05	1.15	1.15
Bombay, India.....[an]	Rs.4/12/-	-/6/6	-/6/6	-/8/0	-/8/0	-/12/-	-/12/-	-/12/-	-/12/-	1/4/-	1/4/-
Tokyo, Japan.......[a]	360Y	41.25	41.25	50.00	45.00	62.50	62.50	62.50	62.50	62.50	57.50
Manila, PI.........[a]	2.00p[k]	0.50	0.50	0.50	0.50	1.00[A]	1.00[A]	1.00[A]	1.00[A]	1.25[D]	1.25
Melbourne, Austral...........[cm]	-/9/-	12/17/6[d]	11/12/6[d]	13/6/8	12/2/6	14/17/6	13/12/6	14/16/8	13/11/8	14/16/8[B]	13/11/8[C]
Johannesburg......[f]	SAf £-/7/2	-/1/4¼[e]	-/1/3½[f]	.....[l]	.....[l]	-/7/1[e]	-/6/7[e]	-/7/1[e]	-/6/7[e]	-/7/1[g]	-/6/7[g]
Tel-Aviv, Israel....[abi]	I£1	4.65	2.50	.....[h]	.....[h]	5.55	3.50	5.55	3.50	.....[h]	.....[h]

[a] 8-hr da [b] per da [c] per 40-hr wk [d] with some skill: 6/52, 13/6/8; 9/51, 12/2/6 [e] 8.2-hr per da—5 days [f] 8.6-hr per da—5 days [g] 8.8-hr per da—5 days; very little steel erection done here [h] no such category [i] income a composite of union wage rates and bonuses; non-union rates 6/52 about 50% higher; non-union rates 9/51: common, I£ 2.5, carpenters, I£ 8, bricklayers, I£ 6 [j] 40-hr wk [k] rate for buying dollars=2.34 p./$1 US [l] no fixed rate [m] official rates—actual labor costs incl holidays, statutory & unofficial additions 6/52: common labor, £ 16/8/7; carpenters £ 18/16/5; bricklayers, £ 19/2/3 per wk [n] 1½% payroll compulsory labor insurance Ranges [A] 0.75–1.00 [B] 11/2/6 to 14/16/8 [C] 10/3/6 to 13/11/8 [D] 1.00–1.25

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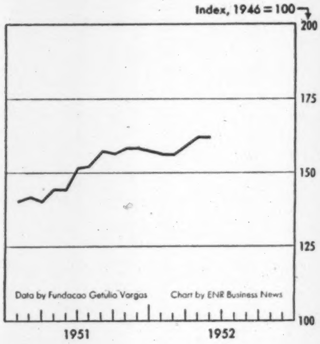
World Construction

Continued from preceding page



BRAZIL construction cost index

Fundacao Getulio Vargas, were 12.5% higher than a year ago. This uses the legal price of cement, not the black market prices being paid for some work.

Lumber prices have dropped sharply since the loss of the export market last fall. Lumber was artifically over-priced during the "compensated" importing, or barter trade agreements. Now, with this dropped, lumbermen, unable to export, are in trouble.

- **Bogota, Colombia:** Labor supply is adequate as is the supply of construction materials. Money is also available. Registration of contracts, which is voluntary, requires contractor to pay a fee. Construction jobs are subject to several taxes such as delineation, occupation of public ways, etc., which average 3% of the total project cost.
- **Santiago, Chile:** Labor and materials supplies are plentiful. Workers are not exerting much pressure to bring wages up with rising cost of living. Government efforts to fight inflation through credit controls have not yet affected construction volume. Few construction products need to be imported, except highly fabricated items, such as elevators.

EUROPE

- **London, England:** Here is a shortage of both skilled and common labor. Materials supplies are adequate for current demands but not plentiful. Money is available for financing new construction.
- **Stockholm, Sweden:** Bricklayers, the highest-paid worker in the country, and carpenters, have exploited the shortage in their ranks to force wages up. Current shortages led to the importing of 300 German bricklayers. Swedish bricklayers continue to restrict recruiting of apprentices. Materials supplies are adequate to support the current volume of construction activity, which is rigidly controlled by the government. Emphasis is on its big housing program, primarily apartment buildings.

Continued on following page

Materials prices outside the United States

Rates in national currency, in Sept., 1951, and June, 1952—carload lots, fob city

North America

CITY and COUNTRY	Exch rate June 52 /$1 US	Struct steel /cwt 6/52	Struct steel /cwt 9/51	Reinf steel /cwt 9/52	Reinf steel /cwt 9/51	Portland cement /bbl 6/52	Portland cement /bbl 9/51	Lumber 2x4, s4s/Mftbm 1st cl pine 6/52	1st cl pine 9/51	2nd cl pine 6/52	2nd cl pine 9/51	Local equiv. 6/52	Local equiv. 9/51
Anchorage, Alaska	$1	4.30[b]	4.30[b]	5.55[b]	5.55[b]	3.80[bf]	3.80[bf]	135[ak]	115[ak]	135[ak]	115[ak]	125[tk]	115[tk]
Montreal, Canada	$1	6.75[amr]	6.57[amr]	4.75[am]	4.75[am]	2.86[a]	2.66[a]	85[t]	95[t]	175[a]	175[a]	...	...
San Francisco, USA	$1	7.15[ah]	7.15[ah]	6.50[a]	6.50[a]	2.96	2.95	79[sn]	70[sn]	.....	.....	...	...
New York, USA	$1	6.50[ai]	6.30[ai]	6.25[a]	6.25[a]	3.55	3.48	81[q]	77[q]	108[qs]	105[qs]	...	...
Mexico City, Mex	8.65p	1193.63[dg]	1111.01[dg]	1327.74[dj]	1230.37[dj]	160[do]	130[do]	1,400	1,400	1,100	1,100	850[l]	850[l]
Havana, Cuba[k]	$1	360–420[c]	360–420[c]	175[c]	185[c]	4.46[ap]	4.46[ap]	.....	180	163	175	...	...
San Juan, PR	$1	240[c]	240[c]	8.50[A]	7.50	4.20	4.20	140	140	110–120	110	...	...

[a] fob whse [b] fob dock, Seattle-freight rate: $55/t to Anchorage, $80/t to Fairbanks for steel; $30/t to Anchorage, $40/t to Fairbanks for cement; wharfage, handling, 3% transp tax not incl [c] per ton, 2000 lb [d] per metric ton, 2204.6 lb [e] subj to 10¢ disc; dealer's comm not incl [f] fob Anchorage: 6/52, 7.75/bbl; 9/51, 7.55/bbl [g] 3in.–15 in. x 12 meters [h] 400–999 lbs [i] 5t or more [j] 3/4–in. x 11 meters [k] delivered to job site [l] Mexican sacred fir, Oyamel [m] plus Dominion, provincial, and municipal sales taxes [n] fob mill, rail freight NW to city: $11.50–$15/Mftbm [o] Tolteca [p] incl delivery $0.20/bbl [q] direct mill shipment [r] American stl. Canadian: 6.55/cwt [s] Douglas Fir [t] Spruce Ranges: [A] 937–1,033.30

South America

		/ton		/ton		/ton							
Bogota, Colombia	2.50p	700[c]	850–900[c]	615[c]	550–600[c]	77[e]	72.80[e]	....	5.50[e]	....	4.30[e]	2.05[e]	....
Rio de Janeiro, Braz	18.50cr	7,200[cr]	6,640[c]	6,000[c]	6,600[c]	800[cq]	800[cq]	3.70[f]	5.00[f]	....	....	2.50[fm]	3.40[fm]
Santiago, Chile	120p	27,000[c]	18,500[c]	17,800[c]	12,900	2,344[c]	1,750[c]	16,000[l]	15,000[l]	8,000[l]	7,400[l]	8,000[gl]	7,400[gl]
Buenos Aires, Arg	14p	2,500[c]	2,500[c]	1,800[c]	1,800[c]	284[c]	220[c]	22[hn]	22[hn]	18[ho]	18[ho]	22[hp]	22[hp]
Caracas, Venez	335Bs	600[ci]	....	600[cdi]	650[bd]	150[ci]	95[b]	....	....	....	....	260[jk]	280[jk]

[a] per ton, 2000 lb [b] per long ton, 2240 lb [c] per metric ton, 2204.6 lb [d] practically all hvy bldg of reinf conc [e] 20x20 cm beam/meter in length [f] per sq ft [g] Alamo poplar [h] per sq meter, 1-in thick [i] fob mill [j] per cu meter [k] Saqui-saqui [l] per Mftbm of 1x10-in [m] 3rd cl pine [n] 3x4-in spruce [o] 1x6-in spruce [p] 1x12-in spruce [q] black market: 6/52, 1,280 cr per t; 9/51, 1,100 cr [r] Fabricated, ready for erection. Single beams, girders 4,800 cr/metric ton

Europe

		/ton		/ton		/ton							
London, England	–/7/2	28/21/–[b]	37/–/–[b]	31/19/–[b]	37/–/–[b]	4/16/9[bkq]	4/6/3[b]	£115–120	£120–125	£100–105	£95–100	....	....
Stockholm, Sweden	5.17kr	890[c]	800[c]	865[c]	806[c]	104.80[cr]	92[c]	9.30[n]	10[n]	7.10[n]	7.90[n]	....	....
Madrid, Spain[j]	10.95p	7,200[cp]	7,200[c]	2,750[cgp]	3,400[cg]	329[ek]	329[ek]	2,500[iA]	2,500[iA]	1,500[iB]	1,500[iB]	....	....
Paris, France	350fr	35,500[ck]	35,500[ck]	34,500[ck]	34,500[ck]	3,835[e]	3,305[e]	12,000[hi]	10,000[hi]	10,000[hi]	8,500[hi]	....	....
Amsterdam, Nethlds	380gld	587.50[c]	549[c]	567.50[c]	537.50[c]	55.50[e]	55.50[e]	....	....	.....	....	240.50[il]	257.30[il]
Frankfurt, Germany	4.20Dm	750[c]	550[c]	680[c]	550[c]	78[c]	75[c]	280[i]	220[i]	250[i]	190[i]	210[i]	170[i]
Rome, Italy[s]	624.92lire	112[dj]	106[dj]	10,300[ej]	9,800[ej]	1,080[ek]	1,025[ek]	48,000[ik]	44,000[ik]	38,000[ik]	33,000[ik]	30,500[ik]	27,000[ik]

[a] per ton, 2000 lb [b] per long ton, 2240 lb [c] per metric ton, 2204.6 lb [d] per kilo [e] per 100 kilos [f] per 165 cu ft [g] av of 5–8mm, 12–17mm, & 25–35mm diams 6/52: 5–8mm, 2500p; 12–17mm, 2,750p; 25–35mm, 3000 per t [h] Maritime, per sq meter 1-in thick; plus transport to city by rail, barge or truck [i] per cu meter [j] fob mill 5[k] delivered [l] 1⅓" x 4" pine [m] 3rd cl pine [n] per cu ft [o] incl 7% tax 6/52; 6.9% tax 9/51 [p] approx 1,000p more in black market [q] paper, 6-ton loads [r] 5.24kr per 0-kilo sack; European grade most used @ 97.80kr per t, 4.84kr per 50-kilo sack [s] Contractors pay 3% tax on materials Ranges: [A] 1,500–2,500 [B] 900–1,500

Africa, Asia, and Australia

		/ton		/ton		/ton							
Cairo, Egypt	LE 0.35	53[cp]	53[c]	53[cps]	50–52[cs]	5.05[cy]	4.70–5.50[c]	30	30	26	23	18	18
Bombay, India[z]	Rs4/12/–	Rs500[b]	Rs500[b]	Rs400[b]	Rs400[b]	Rs112[b]	Rs112[b]	Rs12[lm]	Rs12[lm]	10/–/–[ln]	10/–/–[ln]	....	....
Tokyo, Japan[aa]	360Y	68,000[c]	62,000[c]	39,500[c]	50,000[c]	8,960[c]	8,600[c]	2,700[u]	2,600[u]	2,200[u]	2,000[u]	....	....
Manila, Philippines[aa]	2.00p	900–950[c]	1,500[cg]	400[c]	500[c]	3.20[e]	3.60[ev]	350	350	....	....	180–220[k]	230–240[k]
Melbourne, Australia	9s	35/–/–[boB]	35/–/–[bo]	32/10/–[bq]	45/–/–[bq]	9/12/3[bd]	12/–/–[bd]	8/3/–	7/7/6	....	....	5/2/–	4/4/9
Johannesburg, So. Africa	7s 2d	£31[af]	£25[af]	£32[af]	£25[af]	–/4/5[e]	–/4/5[e]	–/3/5[r]	–/3/4[r]	–/3/5[r]	–/3/4[r]	–/2/1½[hr]	–/2//[hr]
Tel-Aviv, Israel[x]	IL1	275[c]	125[c]	225[c]	80[c]	18.50[c]	9.27[c]	135[u]	55[u]	125[u]	50[u]	78[tu]	....

[a] per ton, 2000 lb [b] per long ton, 2240 lb [c] per metric ton, 2204.6 lb [d] Tasmanian: 6/52, 10/12/3 per t; 9/51, 12/12/6 per t Imported: 6/52, £18–20 per t; 9/51, £19–28 per t [e] per 94 lb bag [f] Local. Imported, fob coastal port: struct'l stl 6/52, £52 per t; 9/51, £65 per t Imported reinf stl 6/52, £50 per t; 9/51, £60 per t [g] High black market price due to restricted supply from US [h] Fir [i] per koko, 1x1x10-ft [k] Red Lauan [l] per cu ft [m] Indian teakwood, 1st cl. [n] Indian teakwood 2nd cl, [o] imported: 6/52, £65–85 per t; 9/51, £75–80 per t [p] add £2 per t for imported [q] imported: 6/52, £55 per t; 9/51, £70 per t [r] 9x3-in, per running ft [s] 3/4–1-in dia; £65 for 3/16-in dia [t] European spruce [u] per cu meter [v] controlled prices [w] local [x] 290p per metric ton [y] quick-drying, hi-grade, 6.15 [z] 3½% sales tax on materials [aa] Sales ax on all materials Ranges: [A] 4/14/– to 5/10/– [B] 32/10/– to 35/–/– pert

World Construction

Continued from preceding page

Much reinforcing and structural steel. imported, costs considerably more than price-controlled Swedish steel. Lumber prices have remained firm despite the collapse of the lumber export market. High production costs and the extensive housing program have helped maintain the level of lumber prices. Higher rates for road transport have added to the cost of some construction materials. Money is available at cheap rates for housing construction but the general credit squeeze makes mortgage money for industrial building hard to get.

• **Madrid, Spain:** Skilled labor is plentiful but some unemployment exists for common. Materials are in better supply than at any time in the past two years. This is due partly to the lull in construction activity. The black market continues in structural and reinforcing steel. Increased cement capacity now makes Spain self-sufficient in this material. She still has a great need for housing but rent controls discourage private builders. Most activity is in apartment houses in Madrid. A boom is indicated ahead for government construction mostly in roads and housing. Contractors expect a general increase in building materials prices before the end of the year.

• **Paris, France:** Skilled labor remains scarce and contractors, by moving them up in the next wage bracket, are paying above the legal minimum for carpenters, bricklayers, and structural ironworkers. Spot shortages of steel occurred this spring due to the heavy volume of exports to the U. S. but supplies are improving. Lower prices for steel and cement are expected to follow the recent cut in coal prices but this depends upon the success of the present government. Lumber prices are moving steadily downward.

• **Amsterdam, Netherlands:** Both skilled and common labor are plentiful and the supply of materials is good. Money is a bottleneck and is often hard to get. Workers on a time-wage, "no tariff," basis get a fixed hourly wage plus small fixed extra allowance. Those on a piecework, "tariff," basis get an extra allowance which depends upon performance.

• **Frankfurt, Germany:** Skilled and common labor are plentiful with a surplus in certain distress areas. Black and grey markets still exist in steel, due to controlled prices and hoarding. Two new rolling mills, to start soon, will help the supply picture. But only with price de-control and further expansion of Germany's basic industries will steel supplies become adequate and the price settle near DM 650 per metric ton. Money and credit are very tight. Some very big construction firms have no trouble, but the medium and small operators have difficulty getting additional working funds. A sales tax of 4% is collected on all construction materials. Payrolls are taxed in addition to income taxes for disability, pension, unemployment, "support of Berlin" and church.

• **Rome, Italy:** Skilled labor is still short but common labor is plentiful. Materials are no longer scarce. Additional cement capacity, to begin production by 1953, will raise total supply about 25% above '52 levels. Money is getting tighter and bank rates have climbed from 12% to 14%. But even at that rate the demand for funds to finance construction outruns supply, and has held down construction volume. Otherwise it could have exceeded even the current high rate to meet the need of additional office space in big cities.

Wages are somewhat above the rates of last fall and prices of building materials have continued their upward trend, although at a slower pace than a year ago. Lumber is up 10% from last year and prices of other materials have risen 3-5%. Contractors' tax bills are heavy in Italy. On contracts they pay a 3% tax and an additional 0.5% stamp duty. There are other taxes on materials and wages.

AFRICA, ASIA & AUSTRALIA

• **Cairo, Egypt:** Both skilled and common labor are plentiful and materials are in good supply. The building boom is now showing signs of abating due to the nation's economic difficulties. This boom had received added impetus from rebuilding to repair widespread damage during the recent riots. In Cairo during the month of June there were more than 100 new buildings going up, most of which were 10-15 stories high.

• **Bombay, India:** Labor is plentiful but contractors complain that unqualified workers are claiming skilled wages. Steel is short. So also is cement, due to poor distribution and lack of cloth bags.

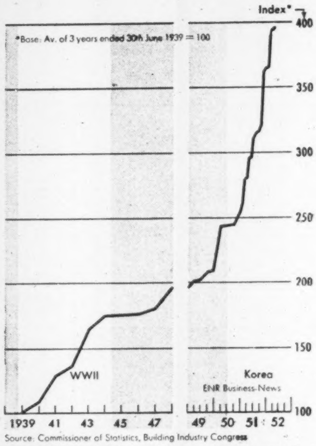
There is also a shortage of money, both public and private, to finance new construction with the result that building activity has been in a decline since last fall. A sales tax on construction materials is in effect in most Indian states.

• **Tokyo, Japan:** Materials, except lumber, are in good supply. Money is still tight with contractors paying banks 10% or working capital funds. Wages and materials prices remained relatively steady over the past year. The construction of multi-million dollar concrete and steel office buildings is booming. The current trend seems to be an emphasis on office buildings rather than industrial plants.

• **Manila, Philippines:** Both common and skilled labor are plentiful but there is an occasional shortage of good equipment operators. Steel and cement are still scarce but the black market for these materials is softening. Prices of other building materials are declining. Many public works projects have been delayed by slow allocation of funds.

• **Melbourne, Australia:** The severe labor shortage is now reversed and there is some unemployment, especially of unskilled. Foreign contractors no longer are required to bring in their own labor. In fact, only specially skilled workers will probably be allowed to enter the country with foreign contractors.

Building materials are now plentiful and many of the black markets have disappeared. Severe restrictions have been put into effect on building materials imports.



Source: Commissioner of Statistics, Building Industry Congress

AUSTRALIAN wholesale price index for building materials

Labor costs are still moving up but at a slower rate. During the recent labor shortage the going wage rates were much higher than legal minimums but these premiums are no longer paid except in remote job sites where most of the developmental work is located. Added to wage costs in Australia are payroll taxes paid by the contractor and a large number of paid holidays plus various statutory and unofficial additions. Labor output is still affected by union restrictions. A productivity team may be sent to the USA to study conditions and methods.

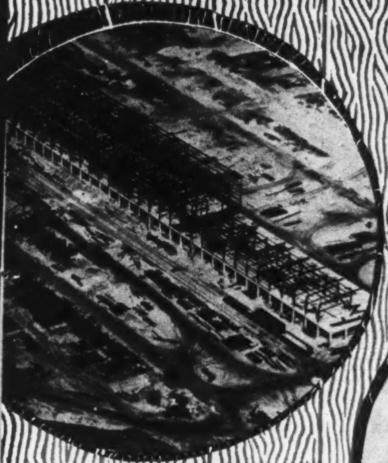
The building materials supply situation is reflected by cut-backs in imports and by the shutting down of some Australian plants due to large inventory accumulations. But Australian steel, structural and reinforcing, is hard to obtain.

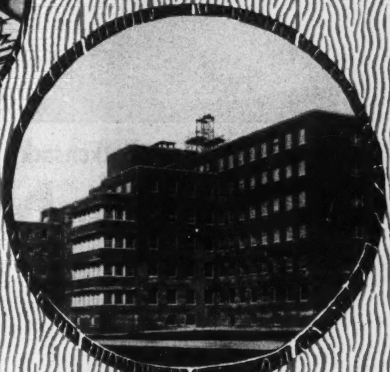
An indication of the decline in construction costs lies in a 5% drop from previous quotations on bids for housing construction for the Victorian Housing Commission.

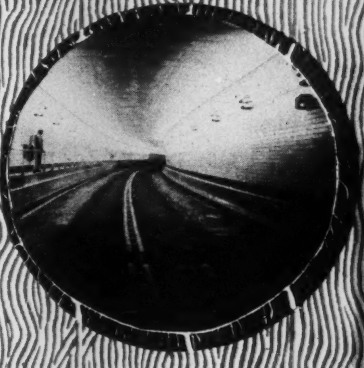
Several contracts in which foreign contractors were interested were cancelled or postponed for lack of federal funds in grants to the states. Many regulations restricting construction were due to end this July. The uranium projects should stimulate construction activity and there are many projects yet to be built for which money is available and which would interest foreign contractors. More construction is on the way due to the de-emphasis of prefabs in Australia.

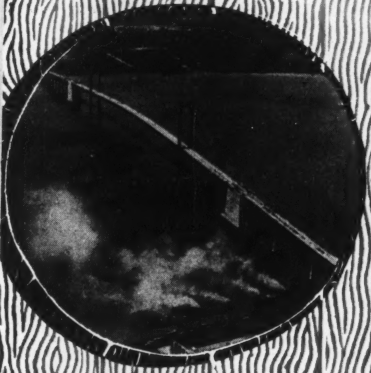
• **Tel Aviv, Israel:** Skilled labor is plentiful, some unemployment exists for common labor. Building materials are adequate to meet the demands of government-controlled construction. Materials can be obtained only by permit. Money for construction is scarce. The trend in material prices is down due to slowdown in construction activity.

SIDEWALK SUPERINTENDENTS WILL TELL YOU...









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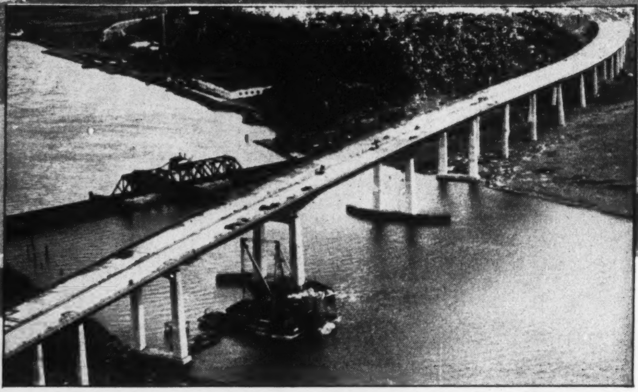
● Hackensack River Bridge consists of three spans, with the central section being a 375-foot silicon-steel plate-girder span, setting a new U. S. record. Flanking spans are 275 feet long. Designed like all of the New Jersey Turnpike for the safe handling of heavy traffic, this viaduct is 86 feet wide, permitting three lanes of traffic in each direction.



American Bridge Protects New Jersey Turnpike's Hackensack River Bridge With

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● **One of the vital links** of the 118-mile New Jersey Turnpike is the $9,500,000 Hackensack River Bridge opened earlier this year. This important portion of the new toll highway which connects the New York metropolitan area with points south, is 5,623 feet long. Spans for this viaduct were fabricated and erected by the American Bridge Division, United States Steel Company.

● **Pittsburgh is proud** that its new XLO Structural Steel Primer was used to safeguard these record-size girders during transit and erection. This new kind of primer is derived from linseed oil, combined with red lead and iron oxide pigments to provide protection for all kinds of fabricated structural shapes during transit, erection and before application of field coats. It is also furnished with 100% red lead, if desired. A variety of IRONHIDE coatings are also available in a range of colors suitable for field coat application.

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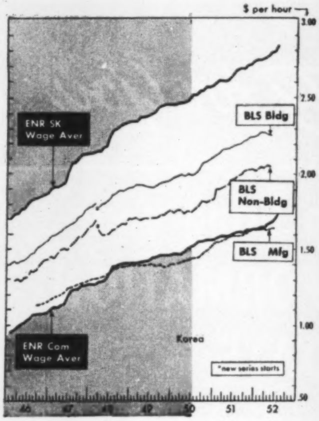

Construction wages—ENR 20-cities averages

SKILLED LABOR, dollars per hour
(Bricklayer, carpenter, ironworker average)

	1926	1932	1939	1945	1946	1948	1949	1950	1951	1952
J	1.24	1.15	1.43	1.64	1.70	2.14	2.35	2.46	2.604	2.760
F	1.24	1.11	1.43	1.64	1.73	2.15	2.35	2.47	2.615	2.760
M	1.24	1.11	1.43	1.64	1.74	2.15	2.38	2.47	2.619	2.773
A	1.25	.95	1.44	1.65	1.76	2.17	2.38	2.48	2.619	2.776
M	1.26	.96	1.44	1.65	1.77	2.18	2.38	2.48	2.629	2.796
J	1.27	.99	1.44	1.66	1.80	2.25	2.39	2.52	2.648	2.808
J	1.27	1.00	1.44	1.66	1.82	2.29	2.41	2.52	2.688	2.849
A	1.28	.98	1.44	1.67	1.83	2.30	2.44	2.54	2.701	2.885
S	1.28	.99	1.44	1.67	1.84	2.32	2.45	2.55	2.701	....
O	1.29	.98	1.44	1.67	1.85	2.33	2.46	2.56	2.719	....
N	1.29	.97	1.46	1.68	1.86	2.34	2.46	2.57	2.728	....
D	1.29	.98	1.46	1.68	1.87	2.35	2.46	2.58	2.752	....
Av	1.27	1.02	1.44	1.66	1.80	2.25	2.41	2.52	2.668	....

COMMON LABOR, dollars per hour
(Building and heavy construction average)

	1926	1932	1939	1945	1946	1948	1949	1950	1951	1952
J	.54	.452	.682	.891	.952	1.272	1.417	1.485	1.585	1.654
F	.54	.452	.680	.891	.968	1.272	1.417	1.485	1.593	1.659
M	.543	.436	.680	.895	.988	1.283	1.424	1.486	1.595	1.664
A	.543	.412	.683	.904	1.004	1.287	1.428	1.493	1.595	1.680
M	.55	.411	.682	.909	1.018	1.300	1.431	1.511	1.608	1.690
J	.55	.412	.684	.916	1.034	1.352	1.441	1.528	1.615	1.706
J	.553	.411	.684	.916	1.058	1.394	1.465	1.538	1.629	1.755
A	.555	.422	.685	.916	1.071	1.394	1.470	1.561	1.637	1.793
S	.555	.431	.685	.917	1.072	1.401	1.478	1.561	1.637	....
O	.55	.431	.685	.917	1.073	1.413	1.478	1.568	1.645	....
N	.555	.426	.685	.917	1.078	1.413	1.478	1.574	1.646	....
D	.555	.427	.685	.938	1.085	1.413	1.478	1.574	1.651	....
Av	.548	.4269	.683	.910	1.033	1.350	1.450	1.530	1.620	....

Skilled and common wage rates in 20 cities

	Hrs	Bricklayers			Carpenters			Structural Ironworkers			Common labor (Av bldg & heavy constr)		
	per	1951			1951			1951			1951		
ENR 20-Cities	day	low	aver	high	low	aver.	high	low	aver	high	low	aver	high
Atlanta	8	$2.50	$2.54	$2.75	$2.00	$2.02	$2.20	$2.25	$2.26	$2.335	$1.025	$1.045	$1.05
Baltimore	8	3.00	3.116	3.20[a]	2.35	2.40	2.58	2.65	2.758	2.90	1.35	1.379	1.49
Birmingham	8	2.75	2.75	2.75	2.035	2.12	2.125	2.30	2.359	2.42	1.15	1.15	1.15
Boston	8	2.775	2.85	2.888	2.375	2.44	2.475	2.70	2.725	2.75	1.75	1.79	1.815
Chicago	8	2.625[b]	2.76[b]	3.25[b]	2.55	2.625	2.70	2.60	2.687	2.80	1.90[h]	1.97[h]	2.05[h]
Cincinnati	8	2.70	2.775	2.90	2.275	2.39	2.475	2.45	2.55	2.665	1.65	1.65	1.65
Cleveland	8	2.70	2.775	3.00	2.70	2.81	2.825	2.70	2.81	2.825	1.92	2.00	2.10
Dallas	8	3.125	3.255	3.437	2.25	2.28	2.337	2.50	2.50	2.50	1.275	1.275	1.275
Denver	8	3.00	3.00	3.00	2.35	2.35	2.35	2.20	2.28	2.35	1.50	1.53	1.575
Detroit	8	2.85	2.86	3.00	2.60	2.60	2.60	2.80[h]	2.858[h]	2.95[h]	1.90	1.90	1.90
Kansas City	8	2.675	2.767	2.86	2.225	2.295	2.365	2.375	2.452	2.53	1.65	1.69	1.73
Los Angeles	8	2.75	2.812	3.00	2.35	2.35	2.35	2.50	2.50	2.50	1.75	1.75	1.75
Minneapolis	8	2.40	2.608	2.90	2.12	2.25	2.40	2.275	2.423	2.57	1.52	1.62	1.67
New Orleans	8	2.60	2.65	2.70	1.975	2.017	2.06	2.35	2.40	2.45	1.10	1.10	1.10
New York	7	3.548[c]	3.548[c]	3.548[c]	3.09[g]	3.09[g]	3.09[g]	3.348[g,i]	3.348[g,i]	3.348[g,i]	1.90	1.90	1.90
Philadelphia	8	3.31[d]	3.322[d]	3.46[d]	2.525	2.587	2.65	2.89[j]	2.985[j]	3.14[j]	1.625	1.642	1.66
Pittsburgh	8	3.00	3.02	3.25	2.65	2.69	2.75	2.625	2.677	2.75	1.60	1.64	1.70
St. Louis	8	3.09[e]	3.09[e]	3.09[e]	2.50	2.633	2.70	2.50	2.645	2.75	1.663	1.735	1.78
San Francisco	8	3.00[f]	3.23[f]	3.25[f]	2.375	2.412	2.42	2.50	2.625	2.70	1.55	1.67	1.70
Seattle	8	3.25	3.275	3.30	2.30	2.36	2.42	2.50	2.535	2.57	1.925	1.946	1.985
Montreal	8	1.60	1.682	1.75	1.40	1.482	1.55	1.50	1.582	1.65	0.92	1.00	1.06

[a] Incl. 10¢ welfare fund, Baltimore. [b] Incl. 7.5¢ welfare fund, Chicago. [c] Incl. 3% welfare plus 20¢ pension fund, New York. [d] Incl. 2% welfare fund, Philadelphia. [e] Incl. 3% vacation stamp fund, St. Louis. [f] 7-hr day, San Francisco. [g] Incl. 3% welfare fund, New York. [h] Incl. 5¢ welfare fund, Detroit and Chicago. [i] 8-hr day, New York. [j] Incl. 9¢ welfare fund, Philadelphia.

Construction wages

Fringe benefits became official in 1952 when the Wage Stabilization Board lifted the ceiling on construction wages to permit 7½ cents for welfare benefits on top of a 15-cent rise in hourly wage rates. In the ENR skilled and common labor wages reported here, and monthly throughout the year, these and other benefits are included as a measure of the cost to the contractor. The extent to which fringe benefits have been adopted for construction labor is indicated by the footnotes, not only of the 20-cities tables shown on this page, but also on the annual roundup for 62 cities on an accompanying page.

Two types of automatic adjustments are in use. One of these is the cost-of-living escalator, tied to the BLS Consumers Price Index. Other contracts call for progressive increments—5-cent increases at one-year intervals for three years, for example—to cover increased productivity. Charleston, W. Va., Detroit and Milwaukee have such contracts and Milwaukee has, in addition, a cost-of-living escalator.

Through July, 1952, the averages for ENR's 20 cities include the new increases for most cities, with only 5 more common labor agreements to come, 5 more for carpenters, 2 more for ironworkers, 10 for bricklayers.

Equipment operator wage rates—as reported to Engineering News-Record

July '52	Truck drivers	Dump		Tractor operators —incl bulldozers			Tractor scraper	Power cranes & shovels		Motor grader oper	Air comp oper	Air tool oper
ENR 20-Cities	1½ t	−4 cy	+4 cy	34-49 hp	70-100 hp	100 & over	15-18 cy	½ cy	¾ cy			
Atlanta	1.25	1.50	1.50	2.125	2.15	2.20	2.075	2.125	2.15	2.075	2.075	2.00
Baltimore	1.45	1.60	1.70	2.00	2.00	2.00	2.00	2.85[a]	2.85[a]	2.00	2.85[a]	2.00
Birmingham	1.37	1.65	1.92	2.19	2.19	2.19	2.44	2.44	2.44	2.30	2.025	1.375
Boston	1.745[b]	....	....	2.625[c]	2.625[c]	2.625[c]	2.625[c]	3.00	3.00	2.625	2.55	2.55
Chicago	1.75[d]	....	....	2.55[e]	2.70[f]	2.60[g]	2.40[h]	3.15	3.15	2.625	2.65	....
Cincinnati	1.91	1.75	1.75	1.65/1.84[i]	1.65/1.84[i]	1.65/1.84[i]	2.35	2.60	2.60	2.35	2.60	2.60
Cleveland	2.00	2.00	2.00	2.75	2.75	2.75	2.75	3.00	3.00	2.75	3.00[j]	2.25
Dallas	1.20	1.35	1.50	1.65/2.50[k]	1.65/2.50[k]	1.65/2.50[k]	1.65/2.50[k]	1.65/2.50[k]	1.65/2.50[k]	1.65/2.50[k]	1.625/2.00[k]	1.25/1.50[k]
Denver	1.80	1.80	1.90	1.70	2.31	2.31	2.31	2.48	2.48	2.31	2.31	1.925
Detroit	2.025	2.025	2.025	2.83[l]	2.83[l]	2.83[l]	2.83[l]	2.83[l]	2.83[l]	2.83[l]	2.55[l]	2.55[l]
Kansas City	1.89[l,m]	1.89[l,n]	2.09	1.915	2.55[l,w]	2.55[l,w]	2.55[l,s]	2.75[l]	2.75[l]	2.325[l,x]	2.40[l,s]	....
Los Angeles	1.83	1.83	1.85	2.30	2.30	2.30	2.68	2.50	2.50	2.43	2.05	1.95
Minneapolis	1.65	1.80[p]	1.95[q]	2.13	2.35[r]	2.57[s]	2.35	2.57[t]	2.82[u]	2.13	2.02	1.75
New Orleans	1.275	1.40	1.40	2.06	2.06	2.06	2.50	2.50	2.50	1.95	1.95	1.95
New York	1.69¼[v]	2.00	2.00	2.625	2.625	2.625	2.75	3.50	3.50	2.75	2.75[a]	2.25
Philadelphia	1.60	1.60	1.60	2.30	2.30	2.30	2.55	2.80	2.80	2.30	2.10	1.75
Pittsburgh	1.90	1.90	2.00	2.72	2.72	2.72	2.72	2.90	2.90	2.80	2.72	2.00
St. Louis	1.66	1.66	1.81	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.25[c]	1.85
San Francisco	1.77	1.77	1.91	2.52	2.52	2.52	2.68	2.85	2.85	2.68	2.13	1.80
Seattle	2.19[m]	2.19[o]	2.39[n]	2.39	2.59	2.59	2.59	2.94	2.94	2.64	2.39	2.28
Montreal	1.00	1.00	1.00	1.53	1.53	1.53	1.38	1.50	1.50	1.38	1.40	1.10

[a] straight time, broken $3.00 [b] 2-axle, 3-axle $1.80, Euclid $2.00 [c] intermediate [d] less than 2-t [e] blade type [f] scoop, bldg [g] scoop, roadwork [h] engineer [i] higher rate for out of city, no differential in hp [j] steel operation, plant operation $2.75, bldg constr $2.625 [k] higher rates are union, other aver figures from various payrolls, open shop [l] await WSB approv [m] flat bed [n] excavating [o] single [p] up to 6 cy [q] 6-8 cy [r] over 50 hp [s] cat oper [t] up to 5 cy [u] 5 cy and over [v] applies to Local 807 [w] bulldozer [x] blade grader [y] form and subgrader

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Building trades wage rates—July 1, 1952

Quoted in $/hr., 8-hr. day; time and one-half for overtime after 40 hr. except where noted.

Compiled by ENR

City and State	Carpenters	Bricklayers	Struct. Irnwkrs.	Reinf. Irwkrs.	Labor Bldg.	Labor, HvyConstr.	Stonemasons	Mason's Helpers	Plasterers	Mosaic & Terrazzo	Tile Layers	Cement Finishers	Lathers	Electrns. (Inside)	Painters	Glaziers	Plumbers	Steamfitters	Roofers	Waterproofers	Sht. Mtl. Workers	Welders	Hoist Eng. 1-Drum	Hoist Eng. 2-Drum	Tract. Op. (30-hp+)	Shovel Operator	Truck Dr. (1½ T+)
Atlanta, Ga	2.20	2.75	2.45	2.40	1.05	1.05	2.75	1.20	2.75	2.75	2.75	2.45	2.50	2.60	2.20	2.20	2.75	2.75	1.50	2.00	2.35	2.34	1.85	2.25	2.08	2.45	1.50
Austin, Tex	2.20	3.30	2.48	2.20	1.00	1.25	3.00	1.25	3.00	2.50	2.75	2.25	3.00	2.75	2.00	.....	2.50	2.50	2.00	.....	2.50	*	2.00	2.25	2.25	2.25	1.25
Baltimore, Md	2.58	[a]3.30	[b]3.13	[b]2.83	[b]1.57	[b]1.57	[a]3.30	[b]1.58	2.75	2.75	2.75	2.45	2.75	2.75	[1]2.25	2.38	2.80	2.80	[2]2.20	2.20	[c]2.88	*	[M]3.00	[M]3.00	2.00	[M]3.00	1.45
Billings, Mont m	[3]2.35	3.00	[3]2.63	[3]2.63	[3]1.76	1.70	3.00	[3]2.13	2.75	3.00	[3]2.01	2.20	§2.50	2.49	‡2.25	‡2.25	2.65	2.65	[3]2.21	[3]2.21	§2.25	2.35	1.97	2.13	2.35	2.35	[3]2.01
Birmingham, Ala	2.24	3.00	2.50	2.40	1.23	1.33	3.00	1.28	2.52	2.63	2.63	2.38	2.35	2.75	2.38	2.13	2.65	2.65	2.15	2.00	2.49	*	2.16	2.44	2.19	2.44	1.37
Bismarck, N. D	2.10	3.00	2.60	2.60	1.35	1.35	3.00	1.65	2.75	.....	3.00	2.10	1.75	2.25	1.97	1.97	2.30	2.30	2.00	2.00	2.00	*	2.00	2.15	2.00	2.25	1.48
Boise, Idaho e	2.30	2.90	2.55	2.30	1.78	1.80	2.90	.....	2.85	.....	.....	2.44	2.71	2.60	[4]2.25	[5]330.	2.58	2.58	2.16	.....	2.30	2.30	2.00	2.10	2.30	2.30	[G]2.35
Boston, Mass gg	2.63	[d]3.06	2.82	2.82	[d]1.99	[d]1.99	[d]3.06	[d]1.99	3.05	2.78	2.68	[3e]3.10	2.97	§2.80	[d]2.46	2.23	[e]2.80	[e]2.90	[6f]2.61	[6f]2.61	[f]2.69	[f]2.69	3.00	3.00	2.63	3.00	[7]1.80
Buffalo, N. Y hh	2.82	[g]3.15	2.94	2.94	§2.02	§2.02	.....	.....	§2.90	.....	[g]2.83	2.77	3.01	2.90	2.59	2.35	3.15	2.90	2.66	.....	2.82	.....	2.78	.....	.....	.....	2.03
Charleston, S. C	1.93	2.50	2.25	2.00	.90	.90	2.50	1.00	2.50	2.50	2.50	1.75	2.00	2.50	1.75	[d]2.25	2.75	2.75	1.75	.....	2.00	2.50	2.00	2.25	1.50	1.25	1.00
Charleston, W. Va q	2.58	3.15	[b]2.78	[b]2.78	1.65	1.65	3.15	1.75	2.55	2.90	2.90	2.30	2.34	2.80	2.38	2.25	2.75	2.75	2.08	2.08	2.50	*	2.63	2.63	2.18	2.63	1.75
Charlotte, N. C	1.95	2.63	2.25	2.00	1.00	1.00	2.50	1.00	2.25	2.25	2.25	1.80	2.00	2.20	1.65	1.65	2.38	2.38	1.38	.....	2.10	.....	1.63	1.88	2.13	2.13	1.00
Chicago, Ill ff	2.95	[h]3.25	2.90	2.90	[h]2.20	[h]2.20	[h]3.25	2.15	[i]3.43	2.70	2.90	[a]2.95	[j]3.07	[j]3.21	2.75	[k]3.17	[c]3.09	[c]3.09	[b]3.03	[b]3.03	[d]3.06	2.80	2.80	2.80	[8]2.55	3.15	[9]1.75
Cincinnati, Ohio ee	2.63	3.12	2.82	[L]2.80	1.92	1.92	3.12	2.12	2.90	2.82	2.82	2.50	2.65	2.90	2.43	2.61	2.80	2.90	2.41	2.41	‡2.60	*	2.80	2.80	[J]2.60	2.80	1.75
Cleveland, Ohio o	3.08	3.12	3.08	3.08	2.33	2.33	2.83	2.33	3.08	2.90	2.90	2.90	3.08	3.08	[e]2.77	2.90	3.00	3.00	2.95	2.95	2.90	3.00	2.98	2.98	2.65	3.00	3.00
Columbus, Ohio t	[3]2.63	3.15	[b]2.83	[b]2.83	1.76	1.77	2.88	1.96	2.75	‡2.50	2.50	2.45	2.75	§2.63	2.38	‡2.18	2.75	2.75	2.40	‡2.58	‡2.63	2.75	2.54	2.54	.....	2.80	‡1.75
Concord, N. H	2.00	2.75	2.75	2.75	1.57	1.25	2.75	1.76	2.75	2.75	2.75	2.75	2.00	2.00	1.49	.....	2.10	2.10	1.85	.....	2.00	2.10	2.65	2.65	2.15	2.65	1.45
Dallas, Tex n	2.49	3.44	2.63	2.35	1.33	1.35	3.44	1.48	3.44	2.75	2.75	2.50	3.44	2.63	2.25	2.00	2.76	2.76	1.93	1.93	2.63	2.61	2.25	2.50	2.50	2.50	.....
Dayton, Ohio dd	2.65	3.10	2.77	2.60	1.83	.....	3.10	2.10	‡2.82	2.83	2.83	‡2.47	‡2.82	3.04	‡2.52	2.43	‡2.80	‡2.80	2.43	2.43	2.65	2.77	2.65	2.65	2.30	2.93	‡1.88
Denver, Colo k	2.35	3.00	2.50	2.50	1.58	1.58	3.50	1.93	3.30	2.75	2.75	2.63	3.30	2.90	2.39	2.35	2.82	2.82	2.48	2.48	2.48	2.82	2.31	2.48	2.31	2.48	1.80
Des Moines, Iowa v	2.55	3.30	2.55	2.55	1.83	.....	.....	.....	2.63	2.50	2.50	2.55	2.55	2.80	2.24	1.98	2.75	2.75	1.90	.....	2.55	.....	2.15	.....	[10]2.15	.....	[H]1.89
Detroit, Mich	‡[11]2.83	‡[11]3.08	‡[11]3.08	‡[11]2.68	‡[11]2.08	‡[11]2.08	3.00	2.20	3.00	2.78	2.78	‡2.53	3.00	‡3.05	[12]2.68	2.30	2.83	[l]2.98	2.85	2.53	2.85	*	2.75	2.90	2.75	2.75	‡[11]2.11
Duluth, Minn a	‡2.35	2.79	§2.48	§2.23	[13]1.70	.....	2.79	.....	‡2.75	.....	2.35	‡2.19	2.55	§2.42	‡2.25	2.10	2.50	2.50	‡2.40	.....	2.48	*	‡2.50	‡2.50	‡[10]2.50	‡2.72	1.80
Fort Worth, Tex l	2.25	3.44	2.63	2.63	1.10	1.20	3.44	1.10	3.13	2.63	2.63	2.50	3.13	2.62	2.25	1.93	2.63	2.63	2.06	2.06	2.63	2.63	2.20	2.48	2.38	[c]2.25	1.19
Harrisburg, Pa p	2.35	2.88	3.06	‡2.81	1.55	1.55	2.88	1.70	2.63	3.00	2.75	2.57	2.63	2.63	‡2.00	1.90	‡2.65	‡2.65	1.85	‡1.85	2.20	*	‡2.95	‡2.95	‡2.58	‡3.20	‡1.95
Helena, Mont	2.38	3.00	2.44	.....	1.65	1.70	.....	1.75	3.00	.....	.....	2.75	2.50	2.40	2.20	2.00	2.65	.....	2.38	2.38	2.38	[I]2.25	1.98	2.20	2.51	2.51	1.46
Houston, Tex §s	2.40	3.18	2.53	2.40	1.48	1.48	3.18	1.68	3.00	2.65	2.65	2.40	3.00	2.88	2.28	2.28	2.75	2.75	2.28	2.28	2.65	.....	2.15	2.53	2.53	2.53	1.70
Indianapolis, Ind	2.68	3.15	§	§	1.80	1.50	3.15	.....	2.90	§	2.50	2.25	2.76	2.83	2.48	§	2.90	2.90	2.17	2.17	2.70	2.90	—negotiating—				
Jackson, Miss	2.15	[K]2.75	2.40	2.15	.95	.95	[K]2.75	1.10	2.40	2.40	2.40	2.40	2.25	2.25	2.00	1.38	2.25	2.25	[14]2.00	1.75	2.00	2.00	2.00	.....	1.65	2.25	1.28
Jacksonville, Fla	2.14	2.70	2.29	1.92	.90	.90	2.70	1.00	2.48	2.50	2.50	1.87	2.48	2.62	1.94	1.95	2.75	2.75	1.92	2.30	2.15	2.29	2.00	2.00	1.63	2.00	1.72
Kansas City, Mo cc	2.55	3.50	2.68	2.54	1.88	1.88	2.74	1.94	3.18	§2.74	2.90	2.52	2.85	2.70	2.41	2.63	2.78	2.75	2.85	2.35	§2.82	*	2.52	2.76	2.52	2.76	1.82
Los Angeles, Calif i	2.57	3.18	2.70	‡2.57	1.94	1.94	3.18	2.02	§3.13	2.40	2.85	‡2.57	3.13	3.00	†2.56	[m]2.16	2.75	2.75	2.50	2.50	2.63	*	2.44	2.44	2.49	2.69	2.02
Louisville, Ky	2.40	‡3.06	2.60	2.40	1.60	1.60	.....	2.00	2.75	.....	2.25	2.40	2.60	2.70	2.31	2.26	2.65	2.63	2.05	2.05	2.50	*	2.50	2.50	1.72	2.50	1.81
Meridian, Miss	2.00	2.75	2.15	2.15	.75	1.00	2.75	.85	2.00	2.50	2.50	2.00	2.00	2.40	2.00	.....	2.38	.....	[14]1.75	1.65	2.13	1.40	.....	.....	1.65	[B]2.25	.....
Milwaukee, Wis b	2.69	2.97	2.64	2.53	1.96	2.08	2.97	2.08	2.75	2.71	2.69	2.41	2.75	2.60	2.65	2.47	2.70	2.70	2.35	2.35	2.53	2.64	2.53	2.53	2.69	2.86	1.91
Minneapolis, Minn u	2.40	2.90	2.57	2.44	1.67	1.67	2.90	2.22	2.75	2.54	2.50	2.60	2.75	[d]2.71	2.23	2.16	2.70	2.70	2.25	2.25	2.50	*	2.35	2.35	[E]2.57	[10]2.57	[F]2.15
Nashville, Tenn r	2.15	2.88	2.25	2.10	1.00	1.15	2.88	1.15	2.75	2.75	2.75	2.10	2.48	2.60	2.10	1.93	2.61	2.61	1.90	1.90	2.25	[N]2.61	2.00	2.10	1.73	2.25	§1.38
New Orleans, La bb	2.22	2.85	2.60	2.60	1.23	1.33	2.85	1.33	2.53	.....	.....	2.21	2.50	2.65	2.00	§	[n]2.68	[n]2.68	2.10	.....	2.32	2.65	1.95	2.50	2.50	2.50	1.35
New York City aa	[3p]†3.15	[a]†3.55	[3p]3.40	[3r]†3.15	[3]2.05	[3]2.05	[3p]†3.35	[a]†2.30	[3t]#3.65	[3r]3.15	[3u]3.15	[3r]†3.15	[3r]†3.15	[3t]#3.45	[3w]†2.98	[3r]†3.15	[3r]†3.30	[3r]†3.25	[3r]†3.15	[3r]†3.15	[r]†3.25	.....	[3p]3.40	[3p]3.40	[3p]2.78	[3p]3.65	1.69
Newark, N. J a	[a]†3.40	[a]†3.65	[q]3.55	[q]3.55	†2.56	.....	.....	.....	[a]†3.65	.....	.....	[a]†3.65	†3.25	[hh]3.28	[a]†2.85	.....	[a]3.25	[a]3.00	3.14	.....	[a]†#3.00	.....	[a]3.35	[a]3.35	[a]2.35	[a]3.35	.....
Oklahoma City f	2.40	3.50	2.50	2.50	1.50	1.00	3.00	1.65	3.30	3.00	3.00	2.48	3.30	2.70	2.00	2.03	2.70	2.70	2.09	.....	2.48	*	.....	2.25	2.00	2.25	1.50
Omaha, Nebr j	2.43	3.00	2.38	2.38	1.58	1.58	3.00	1.48	2.65	2.60	2.60	2.28	2.58	2.73	2.00	1.95	2.58	2.58	1.90	1.90	2.30	1.65	2.20	2.48	2.48	2.48	1.58
Philadelphia ad	2.90	[o]3.46	[y]3.32	[y]2.88	1.75	2.05	3.00	1.75	[b]3.33	‡3.08	[s]3.03	2.90	[b]§3.23	§[aa]3.30	[b]2.40	2.63	[a]3.28	[bb]3.29	‡[b]2.73	.....	[aa]3.14	*	2.90	2.90	2.90	2.99	§1.60
Pittsburgh, Pa	2.75	3.25	2.75	2.75	1.90	1.90	2.75	.....	2.75	.....	3.00	3.00	3.15	2.75	2.73	2.56	3.00	2.80	2.45	2.75	2.75	.....	3.05	3.15	2.72	3.15	1.90
Phoenix, Ariz	2.53	3.50	2.73	2.53	1.88	1.88	3.50	2.25	3.30	3.50	3.30	2.53	3.00	2.59	2.45	.....	[e]2.60	[e]2.60	2.35	2.35	.....	*	2.40	2.40	2.45	2.65	1.94
Portland, Ore z	‡2.45	3.18	‡2.65	‡2.65	1.85	1.85	3.18	2.35	3.00	2.60	2.75	2.43	2.85	2.72	2.40	‡2.40	2.77	2.77	2.42	2.42	2.58*	*	2.20	2.50	2.20	2.05	1.85
Providence, R. I a	2.45	2.89	2.70	2.70	1.80	1.80	2.89	1.80	2.85	2.48	2.48	2.50	2.85	2.40	1.95	2.23	[e]2.65	2.55	[16]2.20	2.20	2.40	2.40	2.50	2.28	2.88	2.88	1.75
Richmond, Va	2.05	2.75	2.45	.....	1.05	.....	.....	.....	2.56	.....	.....	1.95	.....	2.25	[17]1.88	1.90	2.50	2.50	.....	.....	2.20	.....	1.92	2.20	.....	2.33	.....
St. Louis, Mo a	2.90	[dd]3.55	2.90	2.90	1.97	1.97	[dd]3.55	2.40	3.00	2.85	2.78	[a]2.85	3.00	[aa]2.90	[b]2.68	2.75	[ff]2.90	‡[ee]3.05	[18]2.50	3.00	§2.75	2.90	‡2.40	‡2.95	2.80	2.80	‡1.90
St. Paul, Minn u	2.40	2.90	2.57	2.44	1.67	1.67	2.90	2.22	2.75	2.54	2.50	2.45	2.75	[d]2.71	2.25	2.16	2.70	2.70	2.25	2.25	2.50	*	2.35	2.35	[E]2.57	[10]2.57	[F]2.15
Salt Lake City	2.15	2.75	2.43	2.35	1.60	1.60	2.75	2.00	2.63	2.25	2.25	2.15	2.50	2.40	[19]2.00	1.85	2.50	2.50	2.15	.....	2.25	*	2.10	2.20	2.35	2.50	1.65
San Antonio, Tex x	2.20	3.00	2.50	2.25	1.06	[A]1.59	3.00	1.33	3.00	2.25	2.25	2.50	2.88	2.50	2.00	2.00	2.63	2.63	[20]1.65	.....	2.63	*	1.93	2.20	1.93	2.20	.....
San Diego, Calif i	2.57	[a]3.18	2.46	‡2.57	1.94	1.94	§2.75	2.02	§3.13	2.70	2.70	‡2.57	3.13	2.63	†2.35	[m]2.04	2.75	2.75	2.35	2.35	2.47	*	‡2.44	‡2.44	‡2.49	‡2.60	2.02
San Francisco y	2.60	[21]†3.25	2.85	2.65	1.85	1.85	[21]†3.25	2.60	[21]3.13	[21]2.70	[b]3.08	2.57	§3.13	[hh]3.03	[ii]†2.69	2.45	2.90	2.90	[21]2.50	[21]2.50	[22]2.63	§2.38	2.56	2.56	2.83	3.11	[22]1.92
Santa Fe, N. Mex hh	2.25	3.00	2.45	2.20	1.35	1.35	.....	1.65	2.20	.....	.....	2.20	2.50	2.61	2.12	1.82	2.50	2.50	2.00	.....	2.75	2.20	2.20	2.35	2.20	2.35	1.80
Seattle, Wash w	2.58	3.30	2.78	2.58	2.18	2.14	3.30	2.43	3.15	‡2.98	2.98	2.58	3.00	2.80	2.58	2.28	[ii]2.97	[ii]2.97	2.58	2.58	2.73	2.78	2.71	2.71	2.66	3.01	2.19
Tacoma, Wash hh	2.58	3.30	2.78	.....	2.18	‡2.14	3.30	2.48	3.00	2.58	‡2.83	2.67	‡2.80	2.75	2.58	§2.30	[ii]2.97	[ii]2.97	2.58	2.58	2.73	2.75	2.71	2.71	2.59	2.94	2.19
Toledo, Ohio ac	2.82	3.15	3.04	2.86	2.16	2.00	3.15	2.29	3.04	§	.....	3.04	3.04	3.04	2.65	§	3.04	3.04	2.63	2.63	2.76	*	2.90	2.90	2.76	3.04	§1.83
Topeka, Kans g	[3]2.35	3.15	2.68	2.54	1.43	1.43	3.15	1.50	2.50	3.15	2.75	2.25	2.25	§2.15	2.13	2.40	2.65	2.65	1.85	1.85	§2.13	2.65	§1.58	§2.13	.....	§2.13	[24]1.50
Trenton, N. J a	3.05	‡3.35	[v]3.54	[v]3.54	2.05	2.05	‡3.35	2.05	‡3.35	‡3.35	‡3.35	‡3.35	‡3.05	3.25	2.65	.....	‡3.15	‡3.15	[b]2.98	[b]2.98	[b]3.23	*	3.25	3.25	2.50	3.26	1.75
Tulsa, Okla g	2.50	3.00	2.50	2.50	1.45	1.45	3.00	1.60	3.00	2.50	2.50	2.75	3.00	2.64	2.25	2.20	2.75	2.75	2.00	2.00	2.38	*	1.90	2.15	1.90	2.15	1.65
Youngstown, Ohio h	2.50	3.13	3.16	3.16	1.96	1.96	2.88	2.06	2.81	2.38	2.38	2.69	2.93	2.92	2.92	2.45	2.86	2.86	2.60	.....	2.69	2.86	2.67	2.67	2.27	2.67	2.13

NOTE: Rates rounded to nearest cent * Same as craft doing work † 7-hr day # 6-hr day ‡ Awaiting WSB appr. § Negotiating new rate •[1] House. Steel $2.38 •[2] Comp. Slate & tile $2.48 •[3] eff. 8/1/52 •[4] Brush. Spray $3.07 •[5] Per month •[6] $2.68 eff 9/1/52 •[7] 3-axle •[8] Scoop, bldg. •[9] Less than 2-T •[10] over 50 hp •[11] Add'l 5¢ incr eff 9/1, 5¢ inc eff 10/1 •[12] Brush. Swing $2.86 •[13] Unskilled. Semi-skilled $1.80 •[14] Slate & tile. Comp. $1.75, built-up $1.65 •[15] Up to 5 cy •[16] Comp. Slate $2.40 •[17] Brush. Struc. steel $2.13 •[18] Slate & tile. Comp. $2.48 •[19] Brush. Spray $2.25 •[20] Comp. Slate & tile $2.00 •[21] Seeking 15¢/hr incr. & 7½¢ WF •[22] eff 11/1 $2.70 plus 6½¢ WF & 1 week vac •[23] Dump truck under 4 cy •[24] Light

RANGES: •[A] 1.10–1.59 •[B] 1.25–2.25 •[C] 1.67–2.25 •[D] 1.75–2.25 •[E] 1.78–2.57 •[F] 1.80–2.15 •[G] 1.80–2.35 •[H] 1.82–1.89 •[I] 1.85–2.25 •[J] 1.88–2.60 •[K] 2.50–2.75 •[L] 2.65–2.80 •[M] 2.85–3.00 •[N] 2.25–2.61

BENEFITS: •[a] Incl 10¢ WF •[b] Incl 7½¢ WF •[c] Incl 3% WF •[d] Incl 6¢ WF •[e] Incl 7¢ WF •[f] Incl 4% WF •[g] Incl 8¢ VF •[h] Incl 5¢ WF •[i] Incl 8¢ WF •[j] Incl 6% WF •[k] Incl 10¢ PF •[l] Incl 7½¢ IF •[m] Incl 1-wk pd vac •[n] Incl 5¢ WF eff 8/1/52 •[o] Incl 3½% WF •[p] Plus 3% WF-6PH •[q] Plus 3% WF, 20¢ PF •[r] Plus 3% WF, 3% PF •[s] Plus 6% FB eff 6/1/52 •[t] Plus 10¢ WF, 10¢ PF, 10¢ BF •[u] Plus 5% weekly bonus •[v] Plus 5% W&PF, 4% VF-6 PH •[w] Plus 4% WF, 3% PF •[x] Plus 3% WF, 8% AB •[y] Incl 9¢ WF •[z] Incl 12½¢ WF •[aa] Incl 1½% PF •[bb] Incl 11½¢ WF •[cc] Incl 6¢ VF •[dd] Incl 3% vacation stamps •[ee] Incl 4% VF, 1½% IF •[ff] Plus $1/straight time day V&PF •[gg] Incl 5% WF •[hh] Incl 1% PF •[ii] Incl 8½¢ WF •[jj] Incl 12¢ pd vac & 9¢ WF

OVERTIME: •a DT •b DT Sunday •c DT Sat & Sun oper engrs •d DT Sun & Hol lab •e DT brick, iron •f DT brick, iron, stone mas, plast, mos & ter, tile, lath •g DT brick, iron, stone mas, plast, mos & ter, tile, cement, lath •h DT brick, iron, mos & ter, tile, lath; (DT Sat & Sun) lab, elect, paint, glas •i DT carp, reinf iron •j DT carp, brick, iron, stone mas, plast, lath, plumb, steamf •k DT carp, brick, iron, stone mas, plast, mos & ter, tile, lath, elect, plumb, steamf, sheet met, weld •l DT carp, lab, plast, lath, elect, plumb, steamf, roof, waterp, sheet met, weld, pr shov oper •m DT iron, stone mas & help, cement •n DT all but carp, lab, mas help, mos & ter, tile, cement, elect, paint, glas •o DT all but lab •p DT all but lab, mas help, tr dr •q DT all but lab, cement, paint, glas, roof, waterp, tr dr •r DT all but lab, mas help, cement, glas, roof, waterp, hoist engr •s DT all but lab, mas help, mos & ter, tile, cement, roof, waterp, tr dr •t DT except lab, mas help, mos & ter, tile, cement, paint, glas, roof, waterp, sheet met •u DT Sat, Sun & Hol; (DT) brick, iron, oper engr •v DT carp; (TH) lab, oper engr; rest vary •w DT all but cement; (TH first 2 hrs) glaz •x DT all but cement, paint, glaz, roof, oper engr; (TH 5 p.m.-mid M-F & Sat a.m.) elec; (DT Sat & Sun) plumb, steamf •y DT all but (TH first 4 hr) carp; (TH first 2 hr) brick, stone mas & help, mos & ter, cement, glas, roof, waterpr; (DT Sun) lab; (DT Sat, Sun & Hol) paint; (DT Sat) hoist engr •z DT all but (TH) hvy lab, tile, paint; (DT Sun & Hol) sheet met, oper engr; (DT Sat & Sun) cement, glaz; (TH Oct-Apr) roof, waterp •aa DT all but elect; (DT Sun & Hol) lab, mas help •bb DT all but (DT Sun) lab, mas help •cc DT all but (DT 4:30 p.m. F-6 a.m. Mon & Hol) lab, mas help; (DT mid-8 a.m. Sat, Sun & Hol) tile, paint; (DT 4:30 p.m. F-8 a.m. Mon & Hol) plumb, steamf; (DT Sun & Hol) roof, waterpr; (DT 5 p.m. Sat-7 a.m. Mon & Hol) tr dr •dd DT all but (DT Sun & Hol) lab, cement, roof, waterp, sheet met, oper engr; (TH) glaz, tr dr •ee DT all but (DT Sat, Sun & Hol) paint, oper engr •ff DT all but tr dr; (TH first 2½ hr) lab, cement •gg DT all but (DT Sun & Hol) mos & ter; (TH M-F 7-8 a.m.; 4:30-8:30 p.m.) lab, mas help, cement; (DT Sat, Sun & Hol) glaz •hh No data given

Wage rates—New York City

Dollars per hour

Year	Carpenters	Bricklayers	Masons' Laborers	Common Laborers	Structural Ironwkrs
1874...	$0.23 (10 hrs.)	$0.43 (8 hrs.)	$0.18 (8 hrs.)	$0.14 (10 hrs.)	....
1890...	.43 (8 hrs.)	.47 (8 hrs.)	.28 (8 hrs.)	.14 (9 hrs.)	.... (8 hrs.)
1907...	.63	.70	.38	.22 (8 hrs.)	$0.60
1913...	.63	.70	.38	.23	.63
1930...	1.65	1.93	1.03	1.03	1.93
1932...	1.33 (7 hrs.)	1.47 (7 hrs.)	1.00 (7 hrs.)	.65	1.68
1938...	1.75	1.89	1.00	.91	1.93
1939...	1.75	1.89	1.03	.91	1.93
1942...	1.85	2.00	1.03	.95	2.00
1946...	2.10	2.25	1.23	1.20	2.25
1947...	2.47	2.65	1.44	1.44	2.56
1948...	2.73	2.94	1.62	1.63	2.98
1949...	2.75	3.20	1.70	1.70	3.00
1950...	2.88	3.30	1.78	1.78	3.14
1951...	3.09	3.548	1.90	1.90	3.348

NYC workers also got these benefits:

• **WELFARE:** 3%—carpenters, bricklayers, struct. iron workers, reinf. iron workers,* sheet metal workers,* common labor, plasters, mosaic & terrazzo,* cement finishers,* lathers,* glaziers,* plumbers & steamfitters,* roofers,* waterproofers,* welders, hoisting engineers, shovel operators; 4%—mason's helpers, painters; 4% welfare and pension—electricians. *Also 3% penion.

• **PENSION:** 2% — mason's helpers, plumbers: 3%—see welfare; 20¢ hr—bricklayers, plasterers.

• **PAID HOLIDAYS:** 6 ea—carpenters, struct. iron workers, common labor, electricians, welders, hoisting engrs, shovel operators.

• **HOSPITAL & HEALTH:** 4%—stone masons, tile layers (5% effective 7/5/51 for both); 8%—plumbers in Manhattan and Bronx.

• **COST OF LIVING ESCALATORS:** most trades.

• **CONTRACT STATUS:** 3-yr contract with 17 building trades (except bricklayers, electrical workers, plasterers) ends June 30, 1953. All trades got 15¢/hr increase Aug. 1, 1952. In this agreement labor said members will "use their best efforts in the industry's and the public's interest to increase production and reduce costs by maintaining maximum man-hour output and use of all machinery, tools, appliances or methods which may be practical."

Consumers' price index

U. S. Bu. of Labor Statistics, 1935-'39 = 100

	1940 revision					Adjusted*		
	1939	1945	1946	1949	1950	1950	1951	1952
Jan	.....	127.1	129.9	170.9	166.9	168.2	181.5	189.1
Feb	.....	126.9	129.6	169.0	166.5	167.9	183.8	187.9
Mar	99.2	126.8	130.2	169.5	167.0	168.4	184.5	188.0
Apr	.....	127.1	131.1	169.7	167.3	168.5	184.6	188.7
May	.....	128.1	131.7	169.2	168.6	169.3	185.4	189.0
June	98.2	129.0	133.3	169.6	170.2	170.2	185.2	189.6
July	.....	129.4	141.2	168.5	172.5	172.0	185.5	.....
Aug	.....	129.3	144.1	168.8	173.0	173.4	185.5	.....
Sept	101.3	128.9	145.9	169.6	173.8	174.6	186.6	.....
Oct	.....	128.9	148.6	168.5	174.8	175.6	187.4	.....
Nov	.....	129.3	152.2	168.6	175.6	176.4	188.6	.....
Dec	100.1	129.9	153.3	167.5	178.4	178.8	189.1	.....

1926 June, 124.1 **1932** Dec; 97.3 **1948** Aug, Sept 174.5

* Interim minor adjustments to index based on 1940 full-scale revision are included as announced in Monthly Labor Review, Apr. 1951

High cost of living

The BLS consumers price index climbed to a record high in the summer of 1952. It carried construction wages with it where they were tied to a cost-of-living escalator, as more and more are these days.

The adjusted index is shown here from 1950 on. Also shown is the 1940-revision index from 1939 through 1950.

Adjustments in April, 1951 added some commodities and allowed for an increase in rents.

The cost-of-living rise since Korea is 11.4%. Skilled wages in the same period are up 11.6% and common labor rates are up 11.7% according to the ENR 20-cities averages.

These trends are shown also on the colored insert chart where they are converted to 1949 = 100 to show recent trends.

Construction equipment operator's wage rates

paid in Iowa by Associated General Contractors of Iowa

Kind of equipment operator	Rate per hour 1951	1952
Apprentice Engr or oiler......	$1.40	$1.50
Asph paver or spreader.....	2.00	2.10
Asph plant.....	2.00	2.10
Asphplantmixer	1.90	2.00
Asphroller, high type surf....	1.75	1.85
Asph sprender, back end....	....	1.85
Backhoe, ¾ cy or less.	1.90	2.00
over ¾ cy...	2.05	2.15
B-G loader....	1.60	1.70
Blade grader, pwr on finish work........	1.80	2.00
other work...	1.70	1.80
Boiler, single...	1.40	1.50
2 or 1 & dryer	1.60	1.70
Boom or winch truck........	1.50	1.60
Bulldozer......	1.70	1.80
Churn drill....	1.60	1.70
Clamshell, ¾ cy or less......	1.90	2.00
over ¾ cy...	2.05	2.15
Comb Hvster crane & dozer, ¾ cy or less.	1.90	2.00
over ¾ cy...	2.05	2.15
Compressor....	1.60	1.70
Concr, mech batch plant...	1.90	2.00
Concr, mixer—side loader..	1.60	1.70
paver.......	2.05	2.15
Conveyor......	1.60	1.70
Crane, ¾ cy or less.	1.90	2.00
over ¾ cy...	2.05	2.15
Crusher feeder.	1.60	1.70
Derrick.......	2.05	2.15
Distributor....	1.60	1.70
Ditching mach.	2.05	2.15
Dragline, ¾ cy or less.	1.90	2.00
over ¾ cy...	2.05	2.15
Dredge........	2.00	2.15
Elev grader & Athey loader.	1.75	1.85
Euclid loader...	2.05	2.15
Finishing mach, on concr.....	1.60	1.70
Flexplane......	1.60	1.70
Float..........	1.60	1.70
Form grader...	1.60	1.70
Front end ldr..	1.70	1.80
Group equip greaser......	....	1.60
Hoist, steel erect........	2.05	2.15
LeT rooter.....	1.70	1.80
Mech broom...	1.60	1.70
Mechanics & welders.....	1.70	1.85
Motor crane comb driver & oiler........	1.50	1.60
Motor patrol, on finish work...	1.80	2.00
on other work	1.70	1.80
Paving breaker, drop or pneu.	1.70	1.80
Pile driver.....	2.05	2.15
Power shovel, ¾ cy or less.	1.90	2.00
over ¾ cy...	2.05	2.15
Pump, except dredge......	1.60	1.70
Roller, exc high type asph, self prop........	1.60	1.70
Scoop, one.....	1.70	1.80
in tandem...	2.00	2.10
Screen & wash plant........	1.60	1.70
Side boomcats.	1.70	1.80
Siphons & jets.	1.60	1.70
Sprdr, concr...	1.60	1.70
Sprdr box, self-prop.....	1.70	1.80
Subgrad mach..	1.60	1.70
Tank car heater, comb boiler & booster......	1.60	1.70
Tournapull, DW 10 & all similar equip, under 10 cy strk cap..........	1.70	1.75
over 10 cy...	....	1.90
Tractor, 50 hp, or less, without pwr attach	1.40	1.50
Tractor, over 50 hp...	1.70	1.80
Tractor, rubber tired, pulling sheepsfoot roller.......	1.40	1.50
Vibrating mach not hand....	1.60	1.70
Welding machine.....	1.60	1.70

Canadian building trades wage rates

Dominion Department of Labour, and Canadian Construction Assoc.

	Bricklayers			Carpenters			Electricians			Painters		
	1939J	1945J	1952J	1939J	1945J	1952J	1939J	1945J	1952J	1939J	1945J	1952J
Halifax*...	$1.00	$1.15	$1.54	$.70	$.95	$1.33	$.85	$1.06	$1.43	$.60	$.81	$1.17
Saint John.	.90	1.10	1.72	.50-.60	.81	1.32	.50-.65	.85	1.35	.50-.55	.76	1.15
Quebec*...	.75-.85	1.00	1.45	.55-.60	.80	1.25	.55-.65	.80	1.25	.50-.55	.75	1.20
Montreal...	.80-.90	1.06	1.90	.70	.96	1.70	.75	1.01	1.80	.66	.86	1.60
Toronto....	1.00	1.23	2.35	.90	1.11	2.10	1.00	1.21	2.20	.75	.97	1.75
Hamilton...	.90	1.19	2.05	.75	1.04	1.85	.75	1.05	1.80	.65	.86	1.50
Windsor...	1.15	1.26	2.25	.95	1.18	2.00	1.15	1.26	2.05	.60-.65	.95	1.60
Winnipeg...	1.10	1.25	2.00	.85	1.05	1.80	.85	1.05	1.65	.70	.90	1.55
Saskatoon..	1.00	1.20	2.05	.50-.75	.96	1.80	.70-.80	.93	1.65†	.50-.70	.70	1.30
Edmonton..	1.10	1.31	2.17	.90	1.03	1.70	.85	1.06	1.80	.80	.91	1.45
Vancouver *	1.10	1.29	2.10	.75-.90	1.12	2.00	.75-1.00	1.19	2.10	.63-.80	.97	1.70

	Plasterers			Plumbers			Sheetmetal Workers			Labourers		
	1939J	1945J	1952J	1939J	1945J	1952J	1939J	1945J	1952J	1939J	1945J	1952J
Halifax*...	$.80	$.95	$1.45	$.85	$1.02½	$1.40	$.70	$.85	$1.23	.30-.40	$.52	$0.91
Saint John.	.90	1.10	1.72	.60-.70	.88	1.45	.50-.65	.81	1.15	.30-.40	.53	0.75-1.15
Quebec*...	.75	1.00	1.45	.55-.65	.80	1.25	.55-.65	.80	1.25	.40	.60	0.95
Montreal...	.80	1.06	1.90	.75	1.01	1.79	.65-.75	.96	1.70	.40	.61	1.15
Toronto....	.90	1.21	2.00	1.00	1.17	2.00	.93	1.18	1.95	.35-.50	.67	1.10-1.20
Hamilton...	.90	1.07	2.00	.85	1.07	1.95	.75	1.04	1.65	.35-.45	.65	.85-1.05
Windsor...	.90	1.15	2.00	1.00	1.25	2.05	.70-.85	1.06	2.00	.55	.75	1.10-1.45
Winnipeg...	1.10	1.25	2.00	.95	1.15	1.90	.70	.85	1.65	.40-.45	.63	0.95-1.15
Saskatoon..	.75-1.00	1.06	1.75	1.00	1.06	1.85	.75-.90	.81-.85	1.25	.30-.40	.58	1.13
Edmonton..	1.05	1.31	2.00	1.05	1.16	1.90	.90	1.07	2.00	.40-.50	.61	1.20
Vancouver *	1.00	1.10	2.10	1.00	1.19	2.10	1.00	1.18	2.10	.45-.50	.71	1.40

* Wage increases being negotiated. † Up to $1.75/hr by 8/15/52.

Note: Vacation Pay Assessments for above trades are as follows: Montreal—2%, Toronto—4% (except for painters and sheetmetal workers), Hamilton—2-4%, Windsor—4%, Winnipeg—2%, Saskatoon—4%, Edmonton—4%, Vancouver—2½%.

J—June 1 D—Dec. 1

Canadian wage and cost of living changes—1939–'51

Unweighted average wage increases for 8 principal construction occupations (including vacation pay allowances)

	Per cent increase in wages				in cost of living			
	'39-'51	'48-'49	'49-'50	'50-'51	'39-'51	'48-'49	'49-'50	'50-'51
Vancouver..	134.1	3.2	4.8	15.8	92.8	0.7	6.6	11.1
Edmonton..	102.6	9.8	3.5	9.2	83.6	1.8	6.4	10.3
Saskatoon..	118.5	6.9	3.1	6.3	87.2	0.7	4.2	10.4
Winnipeg...	95.3	5.2	5.3	11.3	83.3	2.3	6.7	10.3
Toronto....	132.1	5.9	9.8	9.1	86.0	1.9	6.2	11.2
Montreal...	132.9	3.4	10.0	11.7	97.3	1.6	6.8	12.5
St. John....	120.4	5.2	5.0	10.7	86.1	1.6	6.1	11.0
Halifax.....	89.5	2.6	1.5	6.8	79.3	1.9	3.5	12.8
Average, 8 cities...	115.7	5.3	5.4	10.1	87.0	1.6	5.8	11.2

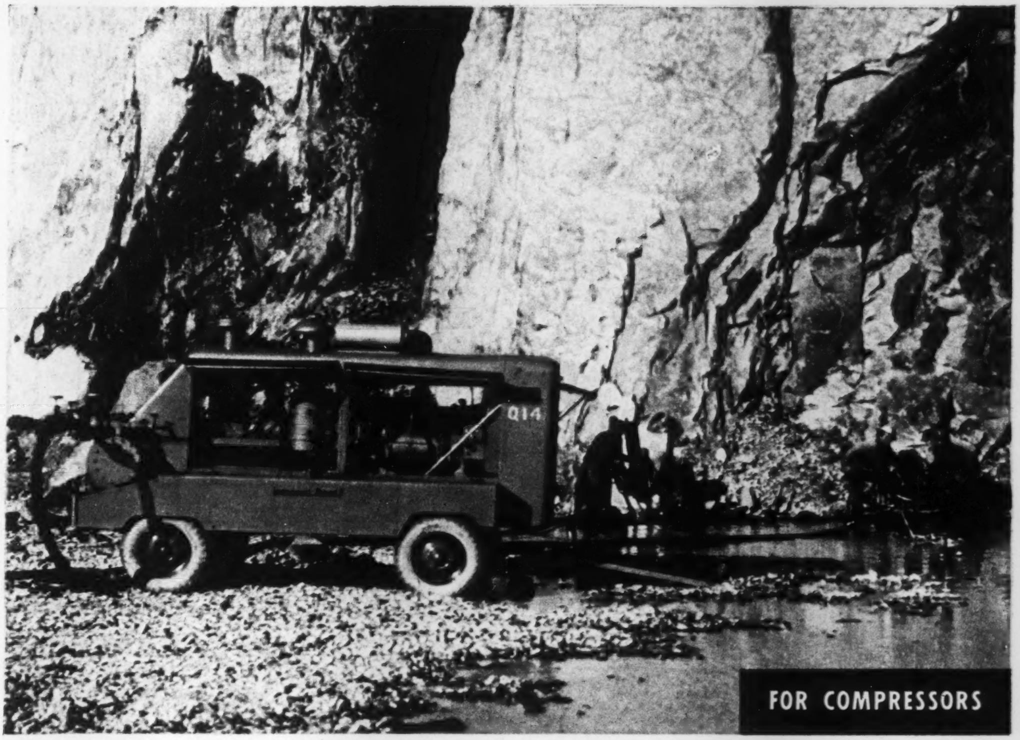
Canadian index of basic construction costs

By Central Mortgage & Housing Corp.— 1939=100

1941	1943	1945	1946	1947	1948
116.3	132.0	137.8	148.2	174.3	202.4

	Jan.	Apr.	July	Oct.	Year
1949.....	208.7	209.2	208.4	208.2	208.4
1950.....	209.5	214.8	227.9	235.5	224.2
1951.....	243.1	251.9	256.6	259.4	254.3
1952.....	258.3	260.8	.....	.....	.....

Weighted index of wholesale prices and wage rates including vacation pay allowances. Intangibles, productivity, etc., not included.



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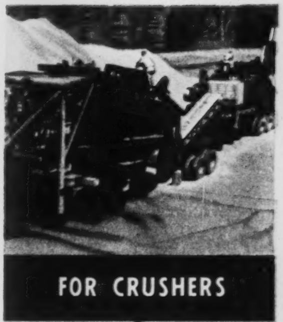

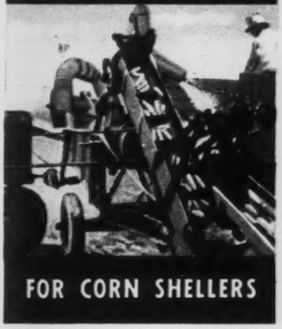

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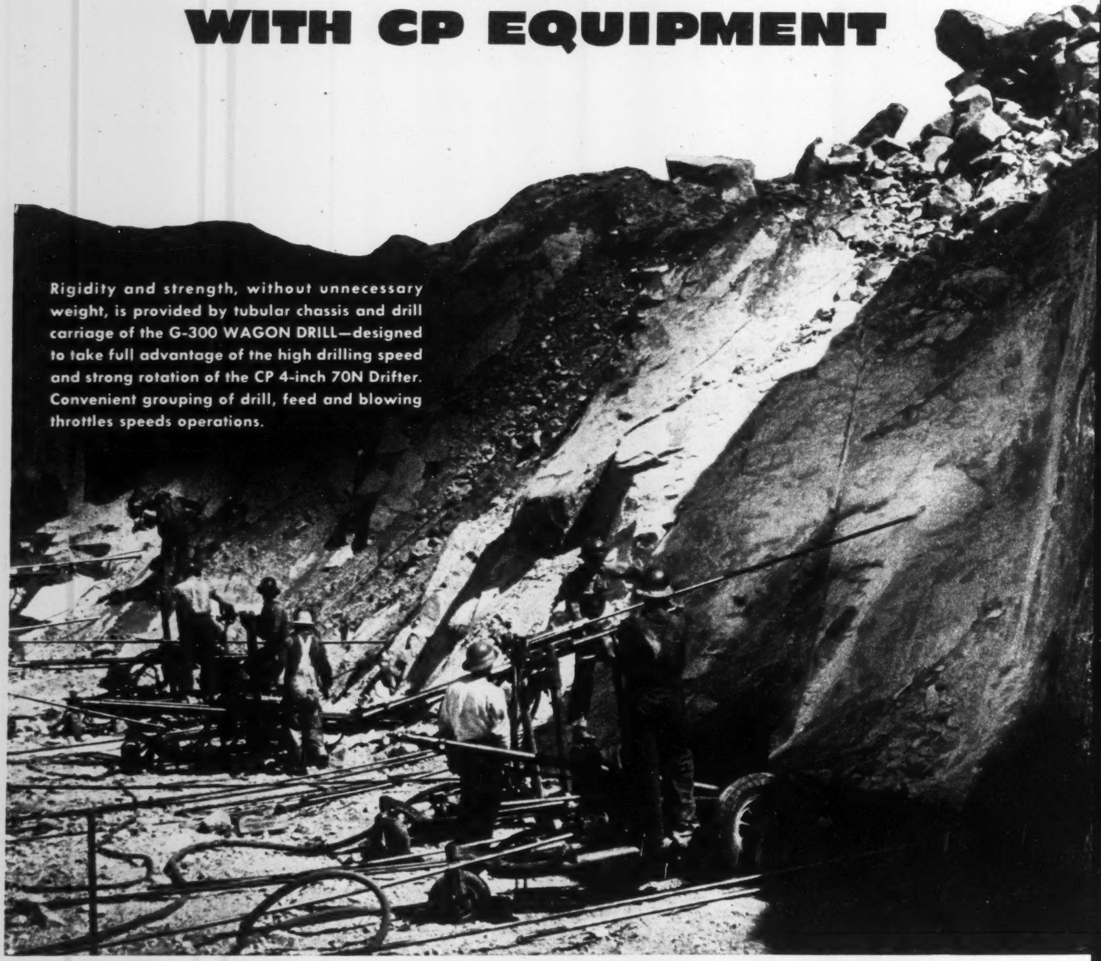

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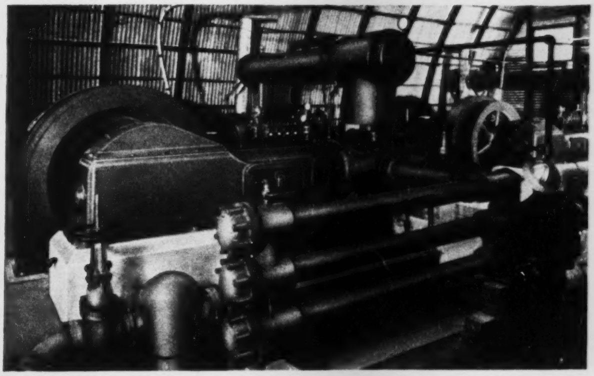

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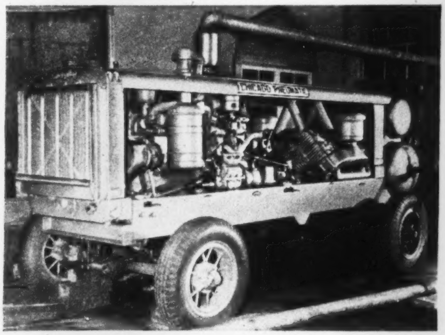

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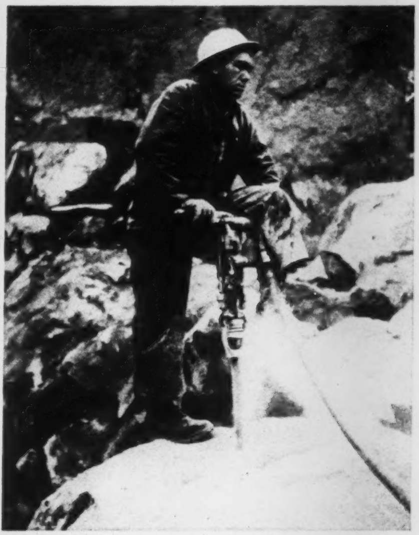

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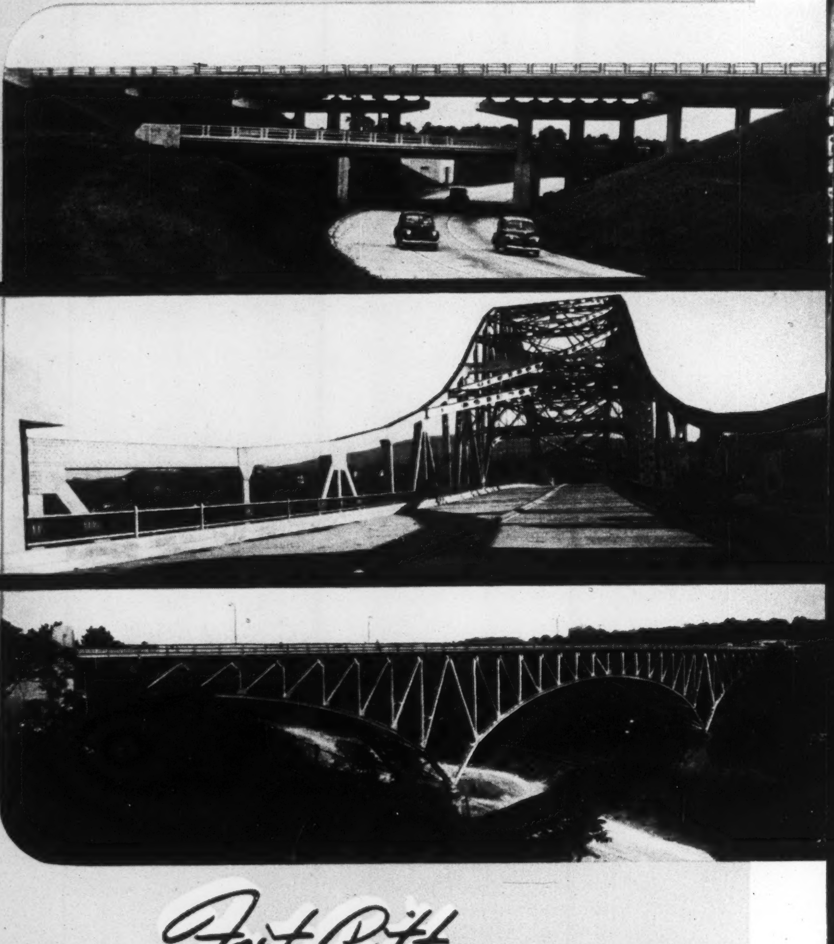

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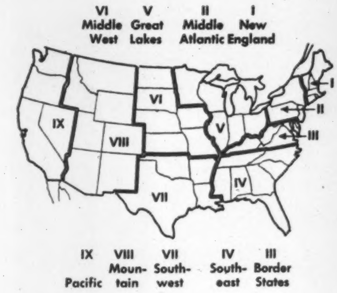


Wages, hours, earnings

The annual BLS roundup of union wage rates in the building trades for July, 1952 will not be available for several months. In the meantime the 1951 study shows, on this and the following page, average rates for the various trades and how they range, regionally and by size of city.

Earnings and hours worked on construction are measured by another BLS series shown here and compared, in dollars per hour, with non-building and with manufacturing wages.

Average union wage rates in building trades, by region

Bureau of Labor Statistics, July 1, 1951

Trade	United States	I New England	II Middle Atlantic	III Border States	IV South-east	V Great Lakes	VI Middle West	VII South-west	VIII Moun-tain	IX Pacific
All building trades	$2.42	$2.25	$2.66	$2.27	$2.03	$2.49	$2.37	$2.16	$2.14	$2.42
Journeymen	2.60	2.44	2.88	2.53	2.30	2.62	2.54	2.39	2.42	2.52
Asbestos Workers	2.63	2.60	2.82	2.53	2.47	2.62	2.65	2.54	2.33	2.62
Boilermakers	2.62	2.60	2.96	2.59	2.48	2.62	2.54	2.38	2.52	2.53
Bricklayers	2.95	2.79	3.19	3.00	2.74	2.77	2.92	3.00	3.03	3.02
Carpenters	2.53	2.27	2.86	2.41	2.17	2.61	2.48	2.23	2.30	2.40
Cement finishers	2.53	2.76	2.82	2.32	2.20	2.52	2.58	2.28	2.37	2.40
Electricians (inside)	2.73	2.53	3.09	2.62	2.50	2.72	2.58	2.59	2.53	2.70
Elevator constructors	2.72	2.61	2.92	2.75	2.54	2.65	2.65	2.61	2.59	2.77
Glaziers	2.34	2.19	2.55	2.24	2.07	2.45	2.43	2.01	2.07	2.23
Lathers	2.90	2.88	2.98	2.82	2.48	2.74	2.71	2.77	2.95	3.11
Machinists	2.57	2.75	2.77	2.47	2.37	2.55	2.61	2.46	......	2.49
Marble setters	2.64	2.54	2.71	2.91	2.65	2.57	2.61	2.54	2.57	2.61
Mosaic and terz wkrs	2.72	2.51	2.94	2.76	2.67	2.58	2.67	2.43	2.72	2.68
Painters	2.41	2.12	2.55	2.23	2.10	2.45	2.34	2.15	2.25	2.49
Paperhangers	2.38	1.87	2.32	2.05	2.16	2.48	2.28	2.04	2.33	2.47
Plasterers	2.93	2.86	3.17	2.83	2.51	2.78	2.89	2.81	2.94	3.08
Plumbers	2.72	2.56	2.93	2.58	2.59	2.67	2.61	2.56	2.59	2.73
Rodmen	2.52	2.67	2.86	2.39	2.21	2.61	2.59	2.26	2.28	2.38
Roofers, composition	2.41	2.40	2.70	2.04	1.91	2.50	2.29	1.98	2.26	2.47
Roofers, slate & tile	2.45	2.54	2.85	2.37	2.02	2.55	2.28	2.02	2.13	2.49
Sheet-metal workers	2.55	2.51	2.88	2.51	2.16	2.56	2.63	2.41	2.27	2.45
Steam & sprklr ftrs	2.70	2.55	2.91	2.51	2.52	2.68	2.61	2.57	2.56	2.73
Stonemasons	2.92	2.81	3.04	3.17	2.75	2.70	2.80	3.03	3.03	3.08
Structural-iron wkrs	2.69	2.70	3.01	2.69	2.35	2.72	2.55	2.44	2.36	2.55
Tile layers	2.72	2.57	2.87	2.75	2.61	2.63	2.59	2.47	2.73	2.77
Helpers and laborers	1.75	1.72	1.94	1.52	1.12	1.87	1.78	1.33	1.71	1.88
Bricklayers' tenders	1.90	1.70	2.12	1.52	1.17	1.93	1.86	1.40	1.95	2.16
Building laborers	1.65	1.70	1.79	1.48	1.09	1.81	1.70	1.27	1.62	1.75
Comp. roofers' helpers	1.50	1.77	1.56	1.70	1.07	1.69	......	1.10	......	......
Elevator constr. helpers	1.95	1.84	2.10	1.94	1.77	1.94	1.89	1.81	1.82	1.94
Marble setters' helpers	1.78	1.82	1.89	1.93	1.18	1.99	1.73	1.54	1.75	2.02
Plasterers' laborers	2.00	1.84	2.20	1.76	1.20	2.07	2.05	1.52	1.96	2.74
Plumbers' laborers	1.84	......	1.96	1.55	1.08	1.98	1.93	1.23	1.82	1.88
Terrazzo workers' helpers	2.07	1.87	2.29	1.80	1.20	2.06	1.91	1.32	1.72	2.11
Tile layers' helpers	1.97	1.84	2.17	1.96	1.15	1.97	1.74	1.50	1.86	2.08

Average hourly earnings on contract construction

Bureau of Labor Statistics, dollars per hour

	Building					Non-Building					Manufacturing				
	1946	1948	1949	1950	1951	1946	1948	1949	1950	1951	1946	1948	1949	1950	1951
Jan.	$1.402	$1.781	$1.918	$1.976	$2.138	....	$1.676	$1.710	$1.753	$1.909	....	$1.302	$1.405	$1.418	$1.555
Feb.	1.422	1.806	1.930	1.988	2.153	$1.296	1.700	1.714	1.771	1.905	....	1.308	1.401	1,420	1.561
Mar.	1.411	*1.786	1.933	1.995	2.171	1.300	*1.628	1.703	1.766	1.921	....	1.310	1.400	1.424	1.571
Apr.	1.423	1.804	1.934	1.996	2.178	1.283	1.600	1.709	1.746	1.933	....	1.314	1.401	1.434	1.578
May	1.431	1.815	1.930	1.998	2.179	1.308	1.600	1.712	1.762	1.935	....	1.324	1.401	1.442	1.586
June	1.444	1.836	1.923	1.995	2.194	1.313	1.614	1.712	1.756	1.972	....	1.340	1.405	1.453	1.599
July	1.473	1.862	1.922	2.006	2.195	1.357	1.634	1.712	1.776	1.997	....	1.356	1.408	1.462	1.598
Aug.	1.482	1.874	1.932	2.031	2.207	1.353	1.639	1.713	1.793	2.000	....	1.373	1.398	1.463	1.596
Sept.	1.510	1.895	1.940	2.076	2.233	1.372	1.663	1.733	1.825	2.022	$1.130	1.386	1.407	1.480	1.613
Oct.	1.526	1.892	1.943	2.083	2.239	1.403	1.672	1.736	1.818	2.038	1.135	1.390	1.392	1.501	1.615
Nov.	1.549	1.906	1.947	2.099	2.257	1.433	1.671	1.751	1.832	2.038	1.146	1.397	1.391	1.514	1.626
Dec.	1.569	1.915	1.973	2.066	2.260	1.434	1.712	1.777	1.850	2.041	1.157	1.400	1.412	1.542	1.636

* Series revised to cover both public and private contract construction and to include workers engaged in off-site operations for construction as well as site workers.

per week, & hours worked

	1951		Apr. 1952	
	Earn/wk	Hrs/wk	Earn/wk	Hrs/wk
All contr const.	$81.86	38.0	$84.89	38.0
Building	82.20	37.4	85.58	37.6
General	75.42	36.7	81.02	38.6
Spec trade	87.20	37.8	88.84	37.0
Plumb & heat	91.44	39.3	91.92	38.3
Paint & decor	78.64	35.9	79.76	34.8
Electrical	102.43	40.2	106.12	39.7
Other	83.59	37.0	85.11	36.2
Masonry	77.92	35.0	73.43	33.0
Plaster & lath	90.22	35.2	85.62	33.2
Carpentry	73.51	35.9	72.63	35.5
Roof & sheet-met.	70.92	36.2	72.44	35.3
Excav & found.	82.18	39.2	80.44	39.8
Non-building	80.25	40.6	81.62	39.6
Highway & street	73.82	40.7	73.27	39.5
Other	84.63	40.5	87.10	39.7

Work injury rates in construction, 1949-50

Bureau of Labor Statistics

	Number estabs reporting	Injury [a] frequency		1950 Severity [b] rate	Aver days lost [d]	1950 Injuries resulting in		
		1949	1950			Perm total [c] %	Perm partial %	Temp total %
Construction	5,606	39.9	41.0	3.8	93	0.7	2.7	96.6
General contractors	2,752	42.6	44.5	4.2	93	0.7	2.8	96.5
Genl bldg contrs	1,846	41.7	45.4	2.9	64	0.4	2.2	97.4
Hvy constrn	330	41.9	42.8	6.4	150	1.3	4.2	94.5
Hwy & street	576	45.5	44.8	4.0	89	0.7	2.4	96.9
Spec-trade contr	2,854	33.2	33.4	3.1	91	0.7	2.4	96.9
Plumb, heat, air cond	726	30.7	28.5	1.7	61	0.7	0.9	98.4
Paint & decor	419	17.7	23.5	3.4	144	1.3	2.7	96.0
Electrical	363	27.7	26.0	3.2	125	1.1	2.7	96.2
Masonry	211	29.3	39.6	2.2	55	0.4	1.2	98.4
Plaster & lath	99	42.5	44.8	.5	10	...	...	100.0
Trzo, tile, marble	71	27.1	21.5	....	...	...	...	....
Roof & sheet-met	278	32.6	43.1	2.4	56	0.4	1.3	98.3
Struct steel erect	55	52.8	58.9	11.0	186	1.4	5.7	92.9
Instal bldg equip	29	37.6	25.5	....	...	...	...	....
Misc spec-trade contrs	603	36.3	36.8	3.1	84	0.6	3.4	96.0

● [a] average number of disabling work injuries per million employee-hours worked. ● [b] average number of days lost for each 1,000 employee-hours worked ● [c] permanent total, including death ● [d] charged to each case

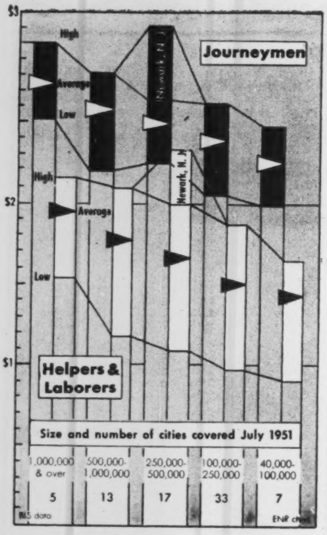
Work injuries

Construction	1949	1950	1951[p]
I All disabilities, Total	183,000	205,000	230,000
to employees	142,000	159,000	185,000
II Fatalities, Total	2,100	2,300	2,500
to employees	1,700	1,800	2,000
III Permanent-total, Total	300	300	n.a.
to employees	200	200	n.a.
IV Perm-partial, Total	7,300	8,200	8,900†
to employees	5,700	6,400	7,200†
V Temporary-total, Total	173,300	194,200	218,600
to employees	134,400	150,600	175,800

(Based on small sample studies by BLS)

● [p] Prelim. ● † Incl. both perm-partial & perm-total disab.

Work injuries increased in 1951 for all degrees of disabilities, but frequency and severity rates are not yet available. The trend, however, is up. This is reflected, too, in some increases in compensation insurance rates.



BLS data

ENR chart

Union wage rates and hours trends

Wages are around 5% higher in the year that has elapsed since the union wage and hours indexes shown here were determined by the annual BLS survey. The 1952 data will be available early in 1953. Neither the wages nor the trends shown here reflect the new fringe benefits that are part of labor's current earnings: welfare funds, retirement, paid holidays, vacations and other social gains.

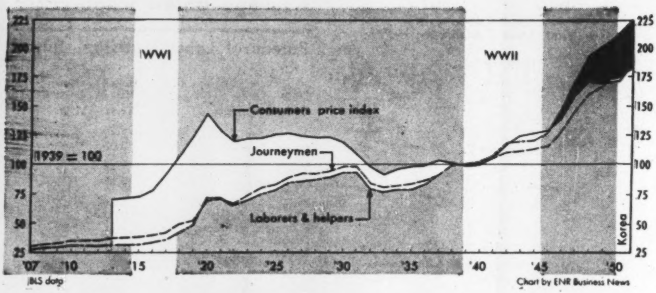
The 5% increase shown above is estimated from the BLS 85-cities quarterly report on union wages for July, 1952. This shows common labor up 4.8% in the year since July 1951. The ENR average for 20 cities for common labor in this period, which adds in fringe benefits, is up 7.7%.

The BLS average increase in the year for bricklayers and carpenters is 5.1%. The ENR average increase, including fringe benefits is 5.9%.

Also the ENR 20 cities, for which wages are reported monthly, are for the most part the larger construction centers in which, as the chart above shows, wage scales run higher than they do in the smaller places.

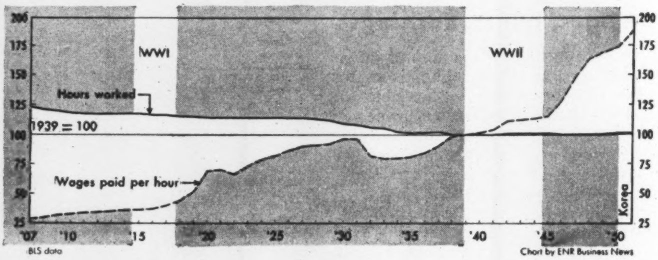
For 1952 the highest union wages go to bricklayers, $3.13 average, $3.65 maximum. The biggest gain for the year is 6.6%, on the average, for the painters. Carpenters gained 4.4% on the average in 85 cities. Plasterers are up 4.8% higher as are plumbers; electricians get 5.1% more and bricklayers, 5.7%.

The lowest skilled rate is for painters, $1.50, same as last year.



BLS data

Chart by ENR Business News



BLS data

Chart by ENR Business News

Union labor trends reported by US Bu of Labor Statistics

Wage rates per hour—Index, 1939=100

Year	All Building Trades	Journeymen	Helpers & Laborers	Bricklayers	Carpenters	Cement Finishers	Electricians (Inside Wiring)	Glaziers	Lathers	Painters	Plasterers	Plumbers & Gas Fitters	Sheet Metal Workers	Steam & Sprinkler Fitters	Stonemasons	Structural Ironworkers	Building Laborers	Bricklayers' Tenders
1907M.	29.3	29.7	27.3	37.7	29.8	34.5	27.9	.....	.....	26.2	37.3	33.3	30.6	30.1	33.9	27.9	30.8	30.
1913M.	36.1	36.9	31.8	41.5	36.8	38.0	33.8	.....	34.6	35.5	39.3	37.9	35.6	35.0	36.7	37.3	34.2	31.
1926M.	88.3	88.7	84.9	94.1	88.5	86.6	81.5	80.7	83.0	90.9	92.4	83.9	86.3	84.9	92.7	81.1	86.9	85.
1930M.	97.0	97.5	93.3	101.8	96.9	95.4	90.9	92.6	89.6	100.6	98.1	91.5	94.7	93.5	99.1	92.5	92.9	94.9
1932M.	83.1	83.6	79.2	87.0	79.6	83.6	87.9	78.0	80.0	85.3	81.4	80.5	83.4	81.0	88.4	81.0	78.7	78.4
1938J..	99.3	99.3	99.2	99.5	99.8	99.6	99.5	99.3	96.8	99.2	99.2	99.1	98.6	99.3	99.7	98.9	99.4	99.7
1942...	111.9	110.9	117.5	108.3	112.1	110.8	113.5	108.8	109.1	110.5	105.0	110.5	116.0	109.3	108.0	108.7	119.6	115.7
1946...	129.3	126.8	146.3	125.6	129.7	128.2	124.9	123.4	124.2	127.3	119.0	123.2	133.0	124.6	126.5	121.4	152.2	141.7
1948...	163.5	159.4	192.7	165.6	164.7	161.1	154.4	155.5	157.8	154.4	148.2	158.2	164.4	154.3	166.0	151.9	200.8	185.5
1949...	170.3	166.1	199.8	174.0	169.1	165.8	168.1	160.5	164.2	162.1	161.9	162.8	169.6	161.3	175.7	157.4	208.4	190.4
1950...	177.8	173.2	210.8	180.4	177.4	172.7	172.3	169.4	179.6	167.7	169.3	166.7	177.9	168.3	187.1	164.8	220.0	203.4
1951...	189.1	184.0	225.3	188.0	189.1	183.7	185.4	177.8	188.0	178.7	177.5	176.6	188.1	178.6	193.6	175.7	235.6	213.9

Hours worked per week—Index, 1939=100

Year	All Building Trades	Journeymen	Helpers & Laborers	Bricklayers	Carpenters	Cement Finishers	Electricians (Inside Wiring)	Glaziers	Lathers	Painters	Plasterers	Plumbers & Gas Fitters	Sheet Metal Workers	Steam & Sprinkler Fitters	Stonemasons	Structural Ironworkers	Building Laborers	Bricklayers' Tenders
1907M.	124.3	123.8	126.1	122.9	121.0	122.7	124.2	.....	.....	133.1	125.8	120.6	117.0	120.3	118.4	121.3	121.6	118.9
1913M.	118.2	118.0	118.3	114.9	115.6	119.8	120.7	.....	121.8	125.9	124.3	119.2	114.9	118.0	115.7	114.1	118.3	116.0
1926M.	114.9	115.1	113.9	113.3	113.5	113.4	115.9	117.5	118.9	120.7	118.2	116.5	111.8	114.4	114.5	112.8	112.1	113.9
1930M.	109.8	110.0	109.0	107.1	109.4	108.1	109.9	112.4	110.4	115.4	113.0	109.9	106.9	108.5	107.1	108.8	110.0	106.9
1932M.	106.5	106.6	105.7	103.1	105.0	105.6	106.2	107.9	109.3	114.2	110.1	108.0	103.6	106.4	104.8	104.8	104.9	104.0
1938J..	100.2	100.1	100.2	99.0	100.0	100.0	100.3	100.2	100.8	110.4	100.0	99.7	100.0	99.6	100.1	100.1	100.1	100.3
1942...	101.1	101.8	98.8	100.8	100.8	100.6	104.6	102.0	102.5	106.5	102.0	99.9	100.9	102.2	100.2	101.1	98.8	98.6
1946...	100.2	101.1	97.4	100.3	100.3	100.4	100.5	102.0	102.2	106.1	104.1	98.3	100.8	101.3	100.0	101.1	97.2	96.9
1948...	100.1	101.0	97.3	100.5	100.2	100.0	100.5	103.5	98.1	106.2	102.9	97.6	100.1	101.3	101.0	101.1	97.2	96.4
1949...	100.2	101.1	97.3	100.1	100.2	100.0	107.2	103.5	98.1	106.2	103.5	97.6	99.9	101.3	100.8	101.1	97.2	96.4
1950...	100.3	101.2	97.3	100.1	100.2	100.0	102.2	103.5	101.2	106.2	105.9	98.3	99.9	101.3	100.8	101.1	97.2	96.4
1951...	100.2	101.1	97.2	100.2	100.2	100.0	102.2	103.5	101.2	104.9	105.9	98.3	99.9	101.3	100.9	101.1	97.0	96.2

*M May 1. *J June 1. *All others July 1.

Average wage rate increase in 85 cities—January to July

U. S. Bu. of Labor Statistics

Trade	Per cent 1Q '51	Per cent 1Q '52	Per cent 2Q '51	Per cent 2Q '52	Cents per hour 1Q '51	Cents per hour 1Q '52	Cents per hour 2Q '51	Cents per hour 2Q '52	Rates, July 2, 1951 Low	Rates, July 2, 1951 Aver	Rates, July 2, 1951 High	Rates, July 1, 1952 Low	Rates, July 1, 1952 Aver	Rates, July 1, 1952 High
Bricklayers......	0.7	0.7	1.5	1.4	1.9	2.2	4.4	4.3	$2.45	$2.96	$3.50	$2.50	$3.13	$3.65
Carpenters......	0.3	0.2	2.4	2.6	0.8	0.3	6.0	6.6	1.82	2.52	3.25	1.93	2.63	3.40
Electricians.....	1.0	1.1	1.9	2.9	2.6	2.9	5.2	8.2	1.90	2.74	3.25	2.01	2.88	3.30
Painters.........	2.4	1.2	1.3	2.7	5.6	2.9	3.0	6.7	1.50	2.41	2.65	1.50	2.57	2.83
Plasterers.......	0.9	2.2	1.2	1.6	2.6	6.5	3.5	4.7	2.25	2.94	3.50	2.25	3.08	3.65
Plumbers........	1.2	0.9	1.2	2.5	3.2	2.5	3.2	7.0	2.00	2.71	3.10	2.19	2:84	3.25
Bldg laborers....	1.1	0.6	2.3	3.6	1.6	1.0	3.7	6.0	0.88	1.66	2.34	0.90	1.74	2.56

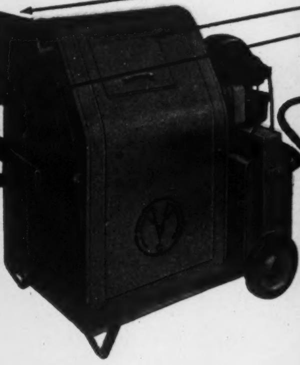
3 New SUPER SPACE HEATERS designed for your job

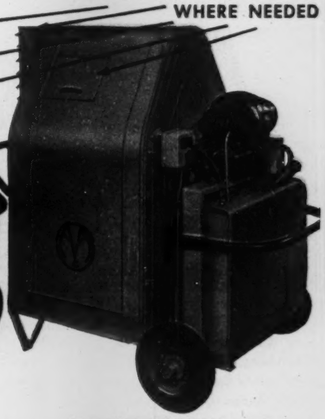
Give you *Fast Safe Heat* for Drying, Thawing, Preheating, Spot Heating, Space Heating and many other uses.

These new Master Space Heaters are tops for *safety, low-cost operation and instant heating. No warm-up . . . no expensive flues. There's a size for every requirement. See your Master Dealer today!

DEFLECTORS THROW HEAT WHERE NEEDED

New Master B-140 high output for smaller heating jobs.


New Master H-231 for larger heating jobs.


New Master H-350 to meet large heating output requirements.

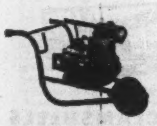
NEW MASTER SPACE HEATER SPECIFICATIONS

MODEL NO.	CAPACITY	*SAFETY	BURNER	FUEL	FUEL CONSUMPTION	HOT AIR OUTPUT	CONTROLS	SIZE	WEIGHT
B-140	140,000 BTU per hour	Indications of carbon monoxide in the exhaust gases of the kerosene fueled Master Space Heater was less than 0.001 per cent by volume . . . as tested by an independent testing laboratory. According to accepted standards this content is one tenth of the amount considered hazardous.	Approved by Underwriters' Laboratory	Kerosene, No. 1 Fuel Oil or No. 2 Fuel Oil	1 gal. per hr.	800 C.F.M.	Fuel tank and burner safety control, solenoid pump control, thermostat control available extra.	W-24½" L-58" H-34"	145 lbs. less fuel
H-231	241,000 BTU per hour				1.65 gal. per hr.	1500 C.F.M.	Thermostat for full automatic temperature control. Fuel tank and burner safety control. Over-heat safety control.	W-29⅜" L-51¼" H-45¾"	295 lbs. less fuel
H-350	350,000 BTU per hour				2.5 gal. per hr.	2500 C.F.M.		W-31½" L-58" H-58"	360 lbs. less fuel

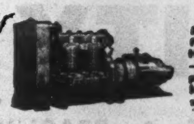
MASTER

BETTER PRODUCTS FOR BIGGER PROFITS

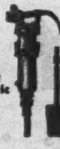
MASTER VIBRATOR COMPANY
101 Davis Avenue, Dayton 1, Ohio



Master portable generator plants —heavy duty dependable continuous and standby plants ½ KW to 100 KW

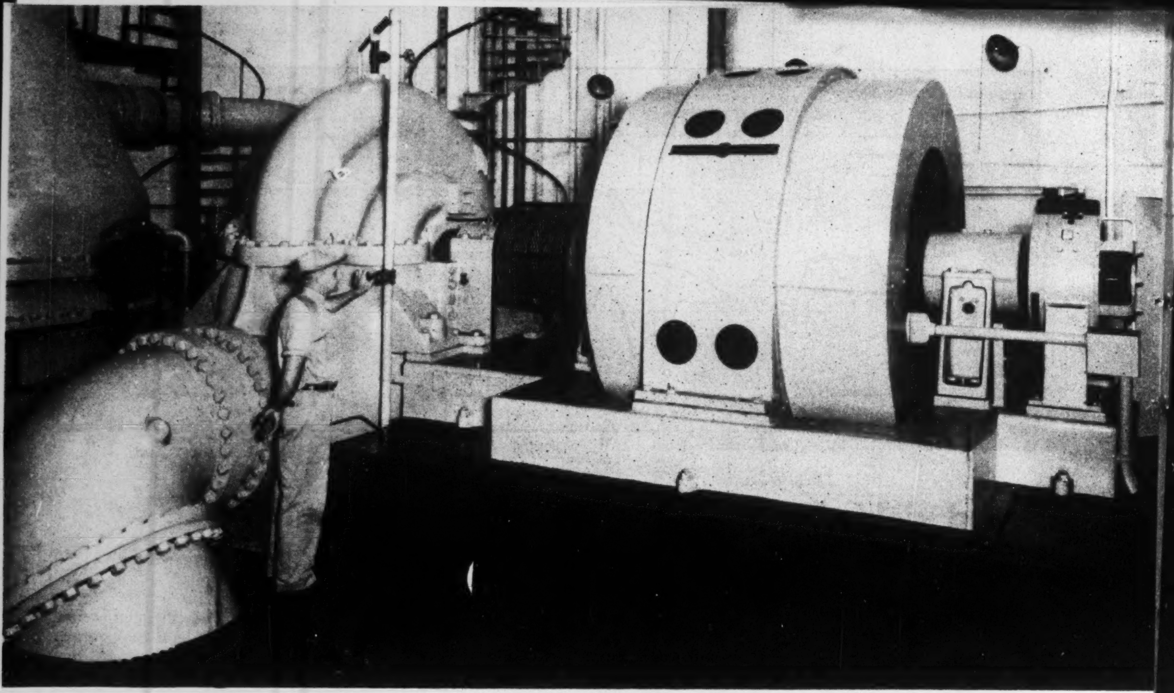


Master Power-Blow Hammer —world's most powerful electric hammer and spade



Gasoline Engine Backfill Tamper

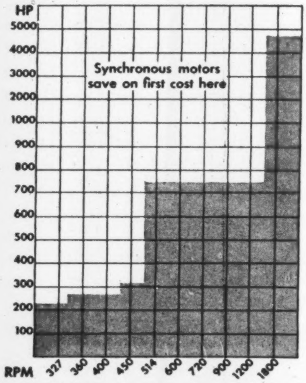
Concrete surfacing attachments for vibrators



Savings in distribution equipment investment were made possible by selection of this General Electric 2500 hp synchronous motor for a municipal pumping station.

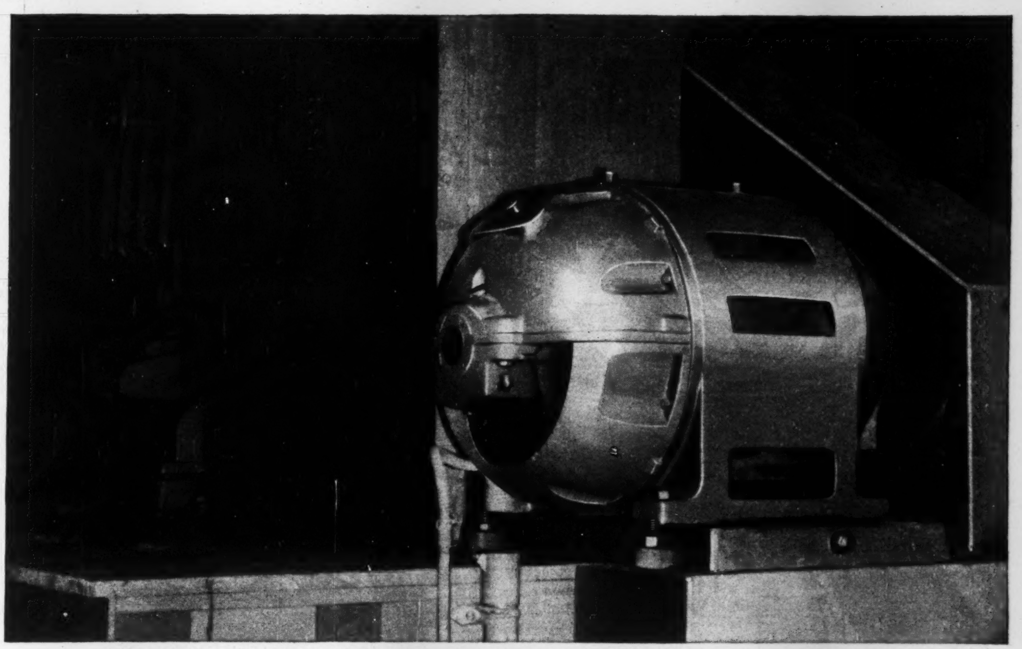
G-E Synchronous Motors

To meet the tough starting requirements of a ball mill, a mining company chose this G-E high-torque synchronous motor rated at 600 hp. Initial cost was low and the motor has given 20 years of dependable service.



Lower first cost of G-E synchronous motors is shown above. For applications in the white area, synchronous motors cost less than any other kind of motor. Calculations below show power savings on a typical 1000 hp, 514 rpm motor.

Gain in efficiency over other types of motors at same rating	**2.2%**
Hourly saving at power rate of $0.01 per/kwh	**$0.184**
Yearly saving (assuming constant operation)	**$1600.00**



Lower operating cost is the rule when General Electric Tri-Clad* synchronous motors are used with equipment such as this horizontal band re-saw, operating almost continuously at heavy loads.

Offer Double Savings

Lower First Costs, Lower Operating Costs Can Be Realized on Large, Constant-Speed Applications in Many Industries

Before you select a drive for a large equipment providing heavy and continuous service, be sure to investigate the economics of General Electric synchronous motors. On many applications such as pumps, compressors, fans, etc., outstanding savings are available.

LOWER FIRST COSTS

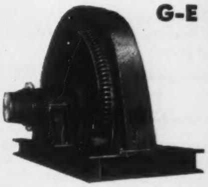
In most ratings where horsepower is equal to or greater than speed, the price tag on a synchronous motor with exciter and control is less than that of any other a-c motor with its control.

And, because a synchronous motor improves plant power factor, initial investment in distribution equipment frequently can be reduced. (The load which any new or expanded power system will carry is proportional to the plant's power factor.)

LOWER OPERATING COSTS

A synchronous motor usually has a higher full-load efficiency than any other type of motor, produces more work per dollar's worth of power consumed. Where loads are heavy and continuous, an advantage of from 0.5 to 3.0% in efficiency pays off.

Engineers with many years of field experience will tailor G-E synchronous motors and control to your job. Call in your General Electric representative—he'll be glad to discuss your particular application. And for more information on G-E synchronous motors, write for bulletins GEA-5332 (low-speed) or GEA-5426 (high-speed) to Section 770-26, *General Electric Company, Schenectady 5, N. Y.*



BE SURE TO SPECIFY G-E SYNCHRONOUS MOTORS

The result of more than 55 years experience in development, manufacture, and successful application, General Electric's line of synchronous motors is available in low speed and high speed types, engine-type and Tri-Clad* construction.

Numerous exclusive design and construction features promote long, dependable service. Get the full details!

**Reg. trademark U.S. Pat. Off.*

GENERAL ELECTRIC

770-26

MONEY, MONEY, MONEY, MONEY!

(an ad about money)

By Mr. Friendly

IF we saved your company
200 grand or so
Would you feel sad
... would you feel low,
As you counted greenbacks
would you sigh,
"Happiness is something
money can't buy ..."

Money only buys you
minks and motor cars,
Florida vacations,
yachts and big ceegars!
If you feel that money
is only so much trash
Don't sign with us, friends,
We save you bales of cash!

Read the facts below ...
it's time you knew
Savings like this
could happen to you!

The case of UTICA DROP FORGE!

Company: Utica Drop Forge & Tool Corp., makers of quality tools, and buckets and blades for jet engines. Policyholder for 35 years!

Savings through lower premium rates: $163,000 in last 10 years alone!

Savings through dividends: $79,000 in last 10 years alone!

Moral: If you're interested in service that can save you important money through fewer accidents, better production, happier people and lower rates . . . why not write American Mutual Liability Insurance Co., Dept. 0-117, 142 Berkeley St., Boston 16, Mass., for the case story of Utica Drop Forge and Tool Corp.

AMERICAN MUTUAL

service from salaried representatives in 78 offices!
savings from regular substantial dividends!

©1952, AMERICAN MUTUAL LIABILITY INSURANCE COMPANY

Base rates on compensation insurance for construction—January 1, 1952

Data Compiled by Herbert L. Jamison & Co., Insurance Advisers and Auditors, New York, N. Y. (Base rates in effect January 1, 1952—subject to increase or decrease according to experience ratings)

Classification of Work	Ala.	Alas.	Ariz.	Ark.	Calif.	Colo.	Conn.	Del.	D. C.	Fla.	Ga.	Idaho	Ill.	Ind.	Iowa	Kans.	Ky.	La.	Me.	Md.	Mass.	Mich.	Minn.	Miss.	Mo.
Carpentry 1-2 family residences	$0.99	$3.47	$5.11	$2.26	$2.25	$1.80	$2.45	$1.70	$2.10	$2.84	$1.30	$2.88	$1.98	1.91	1.41	1.74	1.75	2.92	1.38	1.68	3.55	2.38	3.16	3.90	2.67
Carpentry 3 stories or less	1.26	3.95	5.11	3.26	3.72	1.80	2.49	1.70	2.10	2.84	1.53	2.88	2.11	2.58	2.05	2.09	1.75	3.44	1.72	1.68	4.57	2.38	3.16	3.90	2.67
Carpentry Interior trim, cabinet work	.64	2.34	5.11	1.69	3.72	.90	1.94	1.70	1.89	1.48	.87	1.42	1.15	.90	.88	1.06	1.03	1.83	.85	1.31	2.17	1.63	3.16	1.84	2.67
Carpentry General	1.44	7.94	5.11	3.73	3.72	2.25	5.24	1.70	3.01	2.84	2.50	4.26	3.50	2.68	2.36	2.89	3.17	4.11	3.18	2.71	8.36	2.38	3.16	4.90	2.67
Chimney Construction, brick, concrete	4.80	12.22	10.82	11.84	12.47	6.93	12.67	A	12.90	10.76	5.70	12.00	7.40	6.97	5.86	8.81	9.00	13.50	5.62	8.65	7.59	9.74	10.19	12.90	12.66
Concrete Work—Bridges, Culverts—C	2.65	A	8.59	5.46	5.10	3.77	7.18	1.60	7.71	4.11	3.85	6.34	3.26	3.91	3.19	3.57	3.67	6.24	4.02	4.47	10.04	4.02	5.92	8.02	5.36
Concrete Work—3 stories or less—C	.64	6.75	4.19	1.74	1.18	1.60	3.09	1.60	3.54	2.19	.83	2.30	1.62	1.23	1.12	2.04	.97	1.92	1.66	1.58	5.70	1.38	1.73	2.40	1.88
Concrete Work—General—C	1.51	7.14	4.19	2.64	2.53	2.37	5.21	1.60	3.93	2.98	2.01	4.40	2.46	1.61	1.93	3.26	2.07	4.54	1.66	2.85	6.93	2.21	2.31	3.82	4.03
Concrete or Cement Walks, floors, yards	.79	2.76	4.19	1.67	A	1.09	2.15	1.15	1.57	1.70	1.06	1.76	1.09	.99	1.03	1.60	1.12	2.27	1.06	1.78	2.72	1.15	1.45	2.01	2.04
Electric Wiring	1.05	1.83	2.96	1.55	1.84	1.07	1.80	1.00	1.51	1.39	1.04	1.60	1.08	.89	1.00	1.13	.99	1.66	.87	1.53	2.04	1.31	1.03	1.71	1.14
Excavation—Earth—D	1.27	3.82	2.98	4.58	1.93	3.12	3.64	1.15	2.91	2.24	1.66	4.89	1.84	1.46	1.81	2.93	2.81	2.19	2.74	1.92	4.79	2.27	2.97	3.52	3.10
Excavation—Rock—E	2.25	9.09	6.03	5.75	5.21	3.19	6.56	1.95	6.08	5.30	3.54	5.88	3.90	3.20	2.71	3.87	3.78	6.27	2.78	4.00	11.25	4.27	5.14	5.82	5.85
Glazing	1.82	4.33	4.77	4.28	3.72	2.54	5.11	.85	4.38	3.80	2.33	4.21	2.90	2.48	2.36	3.07	3.01	4.98	2.26	3.20	5.39	3.49	14.98	4.66	3.34
Insulating	.82	3.50	A	2.03	2.13	1.31	1.72	A	2.35	1.71	.88	2.38	1.38	1.56	1.26	1.58	1.44	2.39	1.41	1.76	3.80	1.20	2.26	2.69	1.64
Lathing	.85	3.50	2.10	2.23	1.66	1.19	2.50	.75	2.04	1.89	1.15	1.94	1.17	1.20	1.14	1.41	1.38	2.39	1.11	1.55	3.20	1.36	1.59	2.43	2.09
Masonry	.64	5.95	3.91	1.74	2.11	1.60	3.09	.85	2.03	1.65	.83	2.30	1.56	1.06	1.12	2.04	.97	1.92	1.66	1.58	5.70	1.36	1.70	2.40	1.76
Painting & Decorating	1.07	4.77	3.64	2.01	2.97	1.80	3.00	1.85	3.35	2.65	1.44	3.28	1.93	1.93	1.36	2.16	1.71	2.47	1.38	2.50	B	1.91	1.83	3.13	2.28
Pile Driving—building foundations	4.30	9.10	9.33	11.45	11.54	6.68	5.41	4.35	9.27	6.18	5.32	10.78	6.21	5.97	4.38	8.06	7.50	12.70	2.79	6.00	8.21	6.37	7.30	12.53	10.19
Plastering	.82	3.50	4.26	2.03	1.66	1.31	1.72	.75	2.35	1.71	.88	2.38	1.38	1.56	1.26	1.58	1.44	2.24	1.41	1.76	3.62	1.20	1.95	2.69	1.64
Plumbing	.76	1.82	2.64	1.39	1.59	1.10	1.57	1.00	2.05	1.36	1.08	1.70	1.25	1.04	1.11	1.30	1.04	1.91	.97	1.50	2.15	1.28	1.49	1.71	1.30
Roofing	2.87	8.95	5.07	5.67	6.50	4.30	7.06	1.65	5.86	3.71	3.07	8.07	4.24	4.01	5.90	5.23	3.89	4.71	4.80	5.01	17.20	4.72	5.52	7.50	5.85
Sheet Metal Work	1.24	3.04	3.60	2.82	2.19	1.55	2.17	1.65	2.46	2.17	1.39	2.42	1.85	1.23	1.43	1.62	1.68	2.66	1.30	1.81	2.41	1.42	1.73	2.98	1.53
Steel Erection—Door & Sash	1.15	5.21	2.71	2.75	3.52	1.67	3.45	5.50	2.80	2.54	1.57	2.63	2.34	1.67	1.55	1.95	1.94	3.34	1.53	2.12	4.07	2.60	2.66	3.03	2.75
Steel Erection—Interior Ornament	1.24	4.59	4.28	3.14	7.48	1.75	3.58	2.40	3.85	2.75	1.61	A	1.94	1.75	1.61	2.09	2.00	3.54	1.60	2.23	4.07	2.10	2.79	3.46	3.25
Steel Erection—Structural	6.35	19.60	21.23	12.66	11.80	11.46	20.60	5.50	20.73	12.22	7.94	16.23	5.95	5.49	9.81	11.99	10.04	9.68	7.98	6.98	24.21	14.72	8.71	14.64	10.09
Steel Erection—Dwellings—2 stories	2.87	10.77	6.03	6.60	7.48	4.23	8.61	5.50	6.97	6.21	3.96	7.28	5.15	3.46	3.77	5.27	5.39	6.90	4.23	5.23	18.29	4.55	6.01	8.15	7.60
Steel Erection—General	4.22	11.05	21.23	12.17	7.48	6.88	8.67	5.50	15.35	7.60	6.16	11.50	6.45	3.88	6.34	6.42	6.05	9.68	5.65	6.80	18.29	5.89	7.47	13.39	5.24
Tile Work—Interior	.56	1.11	4.28	1.45	1.03	.78	1.67	.55	2.10	.96	.76	1.22	.79	.77	.76	.92	.88	1.49	.76	1.06	1.92	1.23	1.22	1.57	1.10
Timekeepers and Watchmen	1.26	5.95	F	2.62	F	1.74	3.31	F	2.89	2.80	1.70	2.79	2.23	1.75	1.67	2.09	1.95	3.55	1.63	2.24	4.42	2.26	2.82	2.87	3.27
Waterproofing—Brush	1.07	4.77	3.64	2.01	2.97	1.80	3.00	.85	3.35	2.65	1.44	3.28	1.93	1.93	1.36	2.16	1.71	2.47	1.38	2.50	B	1.91	1.83	3.13	2.28
Waterproofing—Trowel—interior	.82	3.50	4.26	2.03	1.66	1.31	1.72	.85	2.35	1.71	.88	2.38	1.38	1.56	1.26	1.58	1.44	2.24	1.41	1.76	3.62	1.20	1.95	2.69	1.64
Waterproofing—Trowel—exterior	.64	5.95	3.91	1.74	2.11	1.60	3.09	.85	2.03	1.65	.83	2.30	1.56	1.06	1.12	2.04	.97	1.92	1.66	1.58	5.70	1.36	1.70	2.40	1.76
Waterproofing—Pressure Gun	1.51	7.14	4.19	2.64	2.53	2.37	5.21	.85	3.93	2.98	2.01	4.40	2.46	1.61	1.93	3.26	2.07	4.54	1.66	2.85	6.93	2.21	2.31	3.82	4.03
Wrecking	6.95	15.99	28.43	17.08	16.84	10.28	15.80	10.35	16.27	11.81	8.02	16.68	8.20	6.18	9.00	8.52	11.15	17.64	9.08	10.15	24.14	16.46	11.36	18.73	14.70

Classification of Work	Mont.	Neb.	Nev. H	N. H.	N. J.	N. Mex.	N. Y.	N. Car.	N. Dak. G	Ohio G	Okla.	Oreg. G	*Pa.	R. I.	S. C.	S. Dak.	Tenn.	Texas	Utah	Vt.	Va.	Wash. G	W. Va. G	Wisc.	Wyo. G
Carpentry 1-2 family residences	$2.49	$2.39	$3.41	$2.00	$2.90	$2.49	$6.50	$1.75	$3.06	$2.01	$3.54	$4.63	$1.40	2.91	2.15	1.31	1.47	2.32	1.70	1.68	1.10	4.08	1.75	3.66	1.50
Carpentry 3 stories or less	2.49	2.39	3.41	2.00	3.00	2.49	6.50	2.01	3.06	2.72	3.83	4.63	1.40	3.67	2.31	1.31	1.78	3.51	1.70	1.68	1.28	4.08	1.75	3.66	1.50
Carpentry Interior trim, cabinet work	1.19	1.14	1.63	1.10	1.65	1.15	6.50	1.36	3.06	.95	2.24	2.14	1.40	2.71	1.56	.97	1.19	1.97	1.70	.84	.69	1.33	1.03	3.66	1.50
Carpentry General	4.02	3.22	5.51	3.15	3.80	3.39	6.50	3.39	3.06	2.82	4.95	5.45	1.40	5.23	6.28	1.36	2.75	3.51	1.70	2.92	1.72	5.40	3.17	3.66	1.50
Chimney Construction, brick, concrete	11.36	8.64	15.56	7.97	8.90	8.51	27.81	9.95	9.85	7.35	16.78	A	A	23.20	13.35	5.30	8.36	12.41	9.57	5.86	4.41	A	9.00	13.35	8.42
Concrete Work—Bridges, Culverts—C	5.58	4.65	7.64	5.41	4.10	5.57	8.47	4.41	5.72	4.12	9.96	7.16	1.50	12.11	8.63	3.65	4.90	3.51	5.13	3.69	2.09	6.72	3.67	6.31	4.51
Concrete Work—3 stories or less—C	1.96	1.48	2.69	2.56	3.50	1.51	7.08	1.12	1.67	1.30	3.62	4.24	1.50	3.74	1.51	1.19	.97	3.51	2.30	1.99	.66	3.98	.97	1.99	2.02
Concrete Work—General—C	3.64	3.22	4.99	4.10	4.10	2.43	7.08	3.21	2.23	1.70	6.19	4.87	1.50	6.75	3.18	1.96	2.56	3.51	3.11	2.11	1.72	4.57	2.07	2.83	2.74
Concrete or Cement Walks, floors, yards	1.51	1.22	2.07	1.37	1.70	1.44	3.70	1.35	1.40	1.04	2.51	2.32	1.50	3.44	1.95	1.16	1.18	1.87	1.42	1.05	.80	2.04	1.12	1.99	1.25
Electric Wiring	1.34	1.20	1.84	1.22	1.80	1.23	3.29	1.53	1.00	.94	1.89	2.40	.90	1.87	2.40	1.01	1.39	1.61	1.45	.92	.68	2.25	.99	1.39	1.28
Excavation—Earth—D	4.10	2.64	5.62	2.83	3.70	3.76	8.39	1.79	2.87	1.54	4.34	5.43	1.50	6.38	2.73	1.85	2.25	2.64	2.86	2.29	1.17	4.79	2.81	3.87	2.52
Excavation—Rock—E	4.70	4.28	6.44	3.99	7.00	3.96	13.92	6.41	4.97	3.37	7.77	A	2.45	10.44	6.67	3.29	4.68	6.12	4.03	2.89	2.45	9.32	3.78	6.76	3.55
Glazing	3.70	3.17	5.07	3.04	4.30	3.16	9.42	3.47	14.49	2.61	6.21	4.90	1.00	8.02	4.99	2.33	3.23	3.50	1.15	2.31	1.80	4.59	3.01	5.06	1.01
Insulating	2.06	1.68	2.82	1.79	1.75	1.94	5.42	1.43	2.19	1.64	3.46	4.16	B	4.03	2.29	1.48	1.18	1.67	3.09	1.35	.87	3.59	1.44	3.16	2.72
Lathing	1.71	1.52	2.34	1.47	1.75	1.54	3.61	1.67	1.54	1.26	2.98	4.16	.80	3.73	2.34	1.21	1.59	2.13	1.75	1.11	.89	3.59	1.38	2.67	1.54
Masonry	1.96	1.48	2.69	2.56	3.40	1.51	6.71	1.12	1.64	1.12	2.44	4.24	1.05	3.74	1.51	1.19	.97	3.51	1.92	1.99	.66	3.98	.97	1.89	1.69
Painting & Decorating	2.94	2.25	4.03	3.06	4.50	2.39	7.04	1.74	1.77	2.03	3.40	4.86	2.00	4.03	3.44	1.98	1.67	1.77	1.94	1.71	1.19	4.56	1.71	2.63	1.71
Pile Driving—building foundations	9.66	8.35	13.23	3.98	5.40	8.32	14.29	9.50	7.06	6.29	16.50	11.58	3.05	8.40	9.07	6.28	8.46	9.89	5.62	3.01	4.44	10.36	7.50	11.96	4.95
Plastering	2.06	1.68	2.82	1.79	1.75	1.94	5.02	1.43	1.89	1.64	3.07	4.16	.80	4.03	2.29	1.48	1.18	1.67	3.09	1.35	.87	3.59	1.44	2.13	2.72
Plumbing	1.42	1.28	1.95	1.37	1.95	1.48	3.91	1.29	1.44	1.10	2.01	2.12	.90	1.99	1.55	1.17	.99	1.76	.95	1.06	.68	1.99	1.04	2.33	.84
Roofing	7.15	7.38	9.80	6.84	7.50	7.14	B	5.27	5.34	4.23	12.62	11.35	1.95	10.22	5.78	4.46	3.54	5.60	5.37	4.42	2.72	B	3.89	9.55	4.73
Sheet Metal Work	2.06	2.04	2.82	1.76	2.10	1.87	5.01	1.94	1.67	1.30	3.15	4.67	1.95	4.82	2.42	1.46	2.16	2.27	1.94	1.38	1.15	4.08	1.68	2.47	1.71
Steel Erection—Door & Sash	2.32	2.09	3.18	2.01	3.10	2.08	4.53	2.28	2.57	1.76	4.13	2.58	4.60	5.12	2.90	1.64	2.15	3.29	1.73	1.51	1.20	A	1.94	3.72	1.52
Steel Erection—Interior Ornament	2.46	2.20	3.37	2.10	A	2.21	6.78	2.38	2.70	1.84	4.37	4.32	3.05	5.40	3.28	1.71	2.28	3.20	1.73	1.60	1.26	4.06	2.00	3.48	1.52
Steel Erection—Structural	15.00	11.43	20.55	10.35	14.40	12.66	27.30	10.01	8.42	5.79	15.14	18.48	4.60	27.97	16.25	8.11	7.53	8.82	7.74	8.44	5.51	17.33	10.04	11.18	6.81
Steel Erection—Dwellings—2 stories	6.73	5.48	9.22	5.19	5.50	5.53	8.53	6.01	5.81	3.65	9.02	8.87	4.60	12.56	9.31	3.36	5.21	8.82	5.72	4.17	2.94	8.46	5.39	5.69	5.03
Steel Erection—General	10.29	8.25	14.10	8.05	7.30	7.94	15.36	10.01	7.22	4.09	11.81	A	4.60	21.09	12.49	5.74	6.28	6.34	7.74	6.05	3.26	11.53	6.05	10.50	6.81
Tile Work—Interior	1.01	1.00	1.38	.97	1.40	1.02	3.89	1.02	1.18	.81	2.44	1.53	.65	2.31	1.44	.85	.99	1.17	1.95	.77	.58	1.44	.88	1.18	1.72
Timekeepers and Watchmen	2.39	2.20	3.27	2.10	A	2.18	6.21	2.36	2.73	1.84	4.35	3.97	F	5.32	2.83	1.81	2.28	F	2.29	1.62	1.32	4.16	1.95	3.98	2.02
Waterproofing—Brush	2.94	2.25	4.03	3.06	4.50	2.39	7.04	1.74	1.77	2.03	3.40	4.86	1.05	4.03	3.44	1.98	1.67	1.77	1.94	1.71	1.19	4.56	1.71	2.63	1.71
Waterproofing—Trowel—interior	2.06	1.68	2.82	1.79	1.75	1.94	5.02	1.43	1.89	1.64	3.07	4.16	1.05	4.03	2.29	1.48	1.18	1.67	3.09	1.35	.87	3.59	1.44	2.13	2.72
Waterproofing—Trowel—exterior	1.96	1.48	2.69	2.56	3.40	1.51	6.71	1.12	1.64	1.12	2.44	4.24	1.05	3.74	1.51	1.19	.97	3.51	1.92	1.99	.66	3.98	.97	1.89	1.69
Waterproofing—Pressure Gun	3.64	3.22	4.99	4.10	4.10	2.43	7.08	3.21	2.23	1.70	6.19	4.87	1.05	6.75	3.18	1.96	2.56	3.51	3.11	2.11	1.72	4.57	2.07	2.83	2.74
Wrecking	14.85	12.77	20.34	12.08	17.70	12.78	A	11.41	10.99	6.51	20.24	23.61	10.00	27.38	19.26	9.51	10.78	13.32	21.59	9.26	5.88	22.14	11.15	16.24	19.00

* Pa. Rates effective 1/2/52 to 7/1/52—increase of 11% (averagewise).

*A Specially rated—refer to company. *B Rate varies with type of work. *C ncludes form work. *D Pile Driving, caisson and cofferdam work separately rated. *E Special occupational disease loadings apply. *F Assigned to main classification. *G Subscription to State Fund mandatory.—Nevada, Industrial Comm., Carson City, Nev. Workmen's Compensation Bureau; Bismarck, N. Dak., The Industrial Commission of Ohio, Columbus, Ohio, State Compensation Commission, Charleston, W. Va. Workmen's Compensation Dept., State Treasurer's Office, Cheyenne, Wyo.

Doing ONE THING WELL

Economical delivery of large tonnages over short or long distances—from one operation to another if need be (see photo above)—that's the function of the Jeffrey Belt Conveyor. You can depend on Jeffrey Belt Idlers to carry the load. They are built to take severe punishment year after year—roller or ball-bearing troughing or return types. A Jeffrey-engineered material handling system means the best in mechanical efficiency—the best method of doing your particular job, providing economy and long life in the equipment recommended. May we be of service to you?

A LOOK AT THESE MAY HELP: **Bin Valves Bucket Elevators Chains Conveyors Coolers Car Pullers Crushers Dryers Feeders Idlers (Belt) Pulverizers Screens Packers Sprockets Weigh-Feeders Transmission Machinery** *LITERATURE ON REQUEST*

THE JEFFREY MANUFACTURING COMPANY

1877 75 YEARS 1952

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The Ohio Malleable Iron Co., Columbus, Ohio
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Cost to own equipment

Assoc. General Contractors of America, Washington, D. C.

Average annual Ownership Expense	— % of capt investment —					
	D %	OR %	IT %	Tot %	U/ mo	E/ %
Air comp., port,						
gas, 60 cf	25	15	11	51	6	8.5
gas & Diesel 105 cf	25	15	11	51	6	8.5
gas & Diesel 210 cf	20	15	11	46	6	7.7
stat., elect 46 cf	25	15	11	51	6	8.5
215 cf	20	15	11	51	6	7.7
Air tools, drifter	25	10	11	46	6	7.7
rock drill	33	10	11	54	6	9.0
hose air ¾"	50	10	11	71	8	8.9
receiver	10	10	11	31	6	5.2
sharpener, forge	17	10	11	37	6	6.3
Batcher equip	25	17	11	53	6	8.8
bins, steel-port	20	15	11	46	6	7.7
bins, stl-knockdn	17	15	11	43	6	7.2
Cement plant, bulk	20	15	11	46	6	7.7
Cranes, Crawler						
Dies. 4-T 10' R	25	10	11	46	8	5.8
6-T 10' R	20	10	11	41	8	5.1
20-T 12' R	13	10	11	34	7	4.9
Gas 6-T 10' R	25	10	11	46	8	5.7
18-T 12' R	13	10	11	34	7	4.9
Truck, Dies or Gas						
4-T 10' R	25	15	11	51	8	6.4
8-T 10' R	20	15	11	46	8	5.8
15-T 10' R	17	10	11	38	7	5.4
Crusher, Cone or Gyr	10	12	11	33	6	5.5
Crusher, Jaw	17	12	11	40	6	6.7
Dragline, Crawler						
Dies. ½ cy 35' bm	25	15	11	51	9	5.7
4 cy 75' bm	15	15	11	41	7	5.9
Elect ½ cy 35' bm	20	12	11	43	9	4.6
3 cy 60' bm	10	12	11	33	7	4.7
Gas ½ cy 35' bm	25	15	11	51	9	5.7
1¾ cy 50' bm	17	15	11	43	7	6.1
Engine,						
Dies. & Clutch 10 hp	15	15	11	41	7	5.9
30 hp	12	12	11	35	7	5.0
165 hp	10	12	11	33	7	4.7
Gas 10 hp	20	15	11	46	7	6.6
45 hp	12	12	11	35	7	5.0
Grader, self propel	20	15	11	46	8	5.8
Hoist, gas doub.-drum	17	10	11	38	8	4.8
Hose	50	10	11	71	7	10.1
Mixer, concrete,						
Gas 3½-S	50	12	11	73	8	9.1
14 -S	33	12	11	56	8	7.0
(skids) 28-S	25	12	11	48	8	6.0
elect 3½-S	30	12	11	56	8	7.0
10 -S	20	12	11	43	8	5.4
Mixer, truck,						
body & eng 1 cy	33	12	11	56	8	7.0
2 cy	25	12	11	48	8	6.0
incl truck 1 cy	33	16	11	60	8	7.5
2 cy	25	16	11	52	8	6.5
Motor, elect 10 hp	10	10	11	31	7	4.4
200 hp	10	10	11	31	6	5.2
Pump, portable						
centr gas	20	18	11	49	6	8.2
elect	17	15	11	43	6	7.2
diaphr gas	20	20	11	51	6	8.5
elect	17	15	11	43	6	7.2
Rope, wire, ¾"	40	20	11	71	8	8.9
manila ¾"	50	20	11	81	7	11.6
Saw, chain	33	15	11	59	8	7.4
Saw, elect hand	33	10	11	54	8	6.8
Scraper, self loading	20	15	11	46	8	5.8
Shovel, Crawler						
Diesel ½ cy	25	15	11	51	9	5.7
3½ cy	14	15	11	40	7½	5.3
Elect ½ cy	20	12	11	43	9	4.6
2½ cy	10	12	11	33	8	4.1
Gas ½ cy	25	15	11	51	9	5.7
1¾ cy	17	15	11	43	8	5.4
Tractor, Crawler						
Dies. 20-33 hp	25	15	11	51	9	5.7
52-62 hp	20	15	11	46	8	5.8
Gas 20-33 hp	33	15	11	59	9	6.6
66-85 hp	20	15	11	46	8	5.8
2-wh, rubber tired	20	15	11	46	8	5.8

FIXED EXPENSE per working month just to own construction equipment is expressed in per cent of cost new in 1949 AGC Manual, Contractors' Equipment Ownership Expense, $1. This does not cover cost of field repairs, fuel lubricants or other operating cost. It is not a rental schedule.

It does cover depreciation (D in table above), overhauling, major repairs, painting (OR), interest, taxes, storage, insurance (IT), total ownership expense (Tot), average use in months per year (U) and expense per working month (E/mo).

Construction machinery price index

Bureau of Labor Statistics, U S Department of Labor, 1947-49 = 100

By type of equipment	1947 Jan.	1948 Jan.	1949 Jan.	1950 Jan.	1951 Jan.	1952 Jan.	1952 June
Construction machinery and equipment, all types	86.3	95.8	108.7	108.0	123.1	124.6	125.5
Power cranes, etc	87.7	95.4	108.3	106.9	123.3	123.6	123.9
Machinery, tractor mounted	83.2	93.8	108.9	109.7	122.9	127.5	130.9
Specialized construction machinery	84.2	100.7	106.5	106.1	119.3	119.5	119.1
Portable air compressors	93.6	98.0	105.4	105.4	124.8	124.8	124.8
Scrapers and graders	85.9	95.9	110.0	108.4	127.3	128.6	129.1
Air tools, hand tools	89.6	97.5	106.0	106.3	120.5	120.5	120.5
Mixers, pavers, etc	89.3	95.6	107.7	105.9	117.9	118.5	118.1
Tractors, non-farm	84.1	95.0	110.1	110.3	123.9	126.6	128.1

All types by year and month

	1947	1948	1949	1950	1951	1952
Aver	90.0	101.8	108.3	111.5	123.6	.....
Jan	86.3	95.8	108.7	108.0	123.1	124.6
Feb	86.9	95.4	108.7	108.0	123.6	125.2
Mar	87.0	97.3	108.6	108.0	123.6	125.2
Apr	87.5	97.5	108.5	108.0	123.6	124.9
May	88.5	97.6	108.3	108.2	123.6	125.5
June	89.5	99.5	108.3	108.1	123.6	125.5
July	90.3	101.4	108.3	108.8	123.7	.....
Aug	90.9	104.1	108.1	112.6	123.7	.....
Sept	91.4	106.7	108.1	114.6	123.7	.....
Oct	92.3	108.0	108.1	115.6	123.6	.....
Nov	93.7	108.6	108.0	116.2	123.8	.....
Dec	94.7	108.7	108.1	121.7	124.0	.....

Construction equipment cost index, 1926 = 100

By Marshall & Stevens, Chicago

1913	63.0	1924	107.2	1935	79.7	1946	124.2
1914	59.2	1925	105.4	1936	83.0	1947	150.3
1915	61.2	1926	100.0	1937	87.2	1948	161.1
1916	67.5	1927	95.9	1938	82.9	1949	161.1
1917	88.2	1928	96.8	1939	82.4	1950	166.2
1918	122.6	1929	91.0	1940	83.4	1951	177.3
1919	129.0	1930	86.1	1941	92.0	3/52	177.4
1920	154.4	1931	77.6	1942	100.8	6/52	177.6
1921	119.7	1932	71.9	1943	101.3		
1922	83.5	1933	71.8	1944	101.6		
1923	97.3	1934	76.0	1945	102.5		

Construction equipment rental rates

Associated Equipment Distributors, Chicago

Type of equipment	Per month	Per week	Per day
Shovels & back-hoes (dipper incl)			
Crawler, gas ½ cu. yd.	535.00	177.00	58.75
Crawler, gas ¾ cu. yd.	795.00	263.00	84.50
Crawler, gas 1¼ cu. yd.	1,050.00	352.00	118.00
Crawler, diesel ¾ cu. yd.	915.00	297.00	96.00
Crawler, diesel 1¼ cu. yd.	1,345.00	447.00	150.00
Crawler, diesel 2 cu. yd.	2,395.00	765.00	255.00
Surveying instruments			
Levels	23.95	8.35	3.15
Transits	29.00	10.50	3.65
Tractor, crawler, & attachments			
33-41 hp. gasoline	318.00	103.00	34.20
66-85 hp. gasoline	507.00	170.00	56.75
46-52 hp. diesel	479.00	160.00	53.75
72-89 hp. diesel	755.00	251.00	82.00
89-135 hp. diesel	920.00	303.00	98.50
Winch, any size, doub drum	94.25	30.50	10.40
Bulldozer 66-89 hp. tractor	148.00	49.25	15.75
Angledozer 66-89 hp. tractor	179.00	60.00	20.25
Tractors-wheeled			
4-wh, rub tired del 93-103 hp.	617.00	206.00	68.70
4-wh, rub tired del 140-160 hp.	989.00	330.00	110.00
2-wh, rub tired del 145-160 hp.	1,510.00	504.00	168.00
2-wh, rub tired del 195-210 hp.	1,962.00	654.00	218.00
Scrapers & Wagons (heaped meas)			
Scraper 7-10 cu. yd.	300.00	98.75	32.50
Scraper 17-22 cu. yd.	675.00	222.00	73.25
Scraper 29-37 cu. yd.	1,207.00	395.00	132.00
Crawl wgns, bot dmp			
9½-12½ cy	276.00	92.00	31.00
14½-20½ cy	428.00	143.00	48.00

Rates shown are based on 1 shift, 8 hours per day, 56 hours per week, 240 hours per month of 30 consecutive days. All costs of operation are paid by lessee, as are also maintenance costs of tractor equipment.

EQUIPMENT RENTAL RATES vary greatly throughout the United States, depending upon local practices and conditions. A compilation of prevailing rental rates (representing as nearly as could be determined an over-all average of rental rates throughout the United States for specified types of equipment) has been made for informational purposes only by the Associated Equipment Distributors, 360 N. Michigan Ave., Chicago, Ill., and is available at $3 per copy. Selected items from the Fifth Edition published in 1950 and reported in ENR March 29, 1951, page 154 continue in wide use. Examples are shown above.

Recommended by the Associated General Contractors of Minnesota, C. F. Sculley, Chairman, Nov-Dec '51

		Rate per		
Type of equipment		hour	day	month
Air compressor, portable				
105 cf	G	1.46	11.69	233.75
210 cf	G	2.54	20.33	406.56
315 cf	G	3.18	25.41	508.20
160 cf	D	2.81	22.44	448.80
210 to 250 cf	D	3.44	27.53	550.55
315 to 365 cf	D	4.24	33.88	677.60
500 cf	D	6.35	50.82	1,016.40
Air tools & accessories				
Air hose, ¾" per 50', with coupl.		0.03	0.20	4.03
Rock drill steels, ⅞" 3" 10"		....	0.03– 0.06	0.53– 1.10
Tamper, backfill, 25 lbs.		0.15	1.19	23.76
Vibrator, pneu pwr, std		0.24	1.93	38.61
Bituminous equipment				
Spreader, aggr or sand, 10'		0.71	5.68	113.64
12' wide		0.86	6.88	137.64
Broom, rot tow type, with pwr.		0.96	7.67	153.34
Distrib, truck mtd, 1,000 gal		3.30	26.40	528.00
1,500 gal		3.63	29.04	580.80
12,000 gal		4.09	32.74	654.72
Aggmix & pulvmix, with pwr		2.74	21.91	438.24
without pwr		1.85	14.78	295.68
Spreader & finisher, 10'	G	9.46	75.74	1,514.70
Booster heater, large		2.28	18.22	364.32
Boiler, vert, 150 lb. pres, 26 hp.		1.76	14.11	282.15
41 hp		2.15	17.23	344.52
55 hp		2.47	19.78	395.51
Buckets, dragline, crane, ½ cy		0.35	2.81	56.10
¾ cy		0.46	3.65	72.93
1 cy		0.65	5.23	106.63
1½ cy		0.68	5.46	109.10
2 cy		0.80	6.38	127.30
2½ cy		0.95	7.57	151.36
Clamshell, digging, std. ½ cy		0.72	5.72	114.35
¾ cy		0.85	6.78	135.63
1 cy		1.09	8.69	173.75
1½ cy		1.33	10.65	212.87
2 cy		1.52	12.16	243.09
2½ cy		1.83	14.62	292.25
Crane truck—10' radius	D or G			
6 to 8 tons		4.08	32.67	653.40
10 to 12 tons		8.17	65.34	1,306.80
15 to 20 tons		10.77	86.13	1,722.60
25 tons		12.62	100.98	2,019.60
Dragline, excav crawler, with bucket				
½ cy 35' boom	D	7.93	63.44	1,268.74
	G	6.93	55.41	1,108.14
¾ cy 35' boom	D	10.20	81.62	1,632.40
	G	8.28	66.22	1,324.40
1 cy 40' boom	D	11.84	94.70	1,894.09
	G	10.00	79.96	1,599.29
1½ cy 45' boom	D	18.41	147.26	2,945.25
2 cy 50' boom	D	23.07	184.53	3,690.50
Grader, self-prop, pn trs,	D or G			
7 tons (light)		2.38	19.06	381.15
8 tons (medium)		5.29	42.35	847.00
10 tons (heavy)		7.94	63.53	1,270.50
Hose, per 10', Disch 1½" diam		.....	0.06	1.25
4" diam		0.03	0.20	3.96
Suction 1½" diam		0.02	0.13	2.51
6" diam		0.11	0.91	18.17
Mixer, concrete, 1 bag	G	1.21	9.70	194.04
2 bag	G	1.71	13.69	273.69
3 bag	G	2.16	17.29	345.77

Continued on page 139

CONSTRUCTIVE

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The deep, reversed, double-helical ribs of Hi-Bond reinforcing bars provide a mechanical grip which gives maximum bond in concrete, thus permitting greater use of steel's potential strength in concrete construction. It also improves transfer of stresses, crack control and resistance to slip . . . advantages that will make possible higher design stresses and thereby lower construction costs. Hi-Bond meets standards set up by ASTM A 305.

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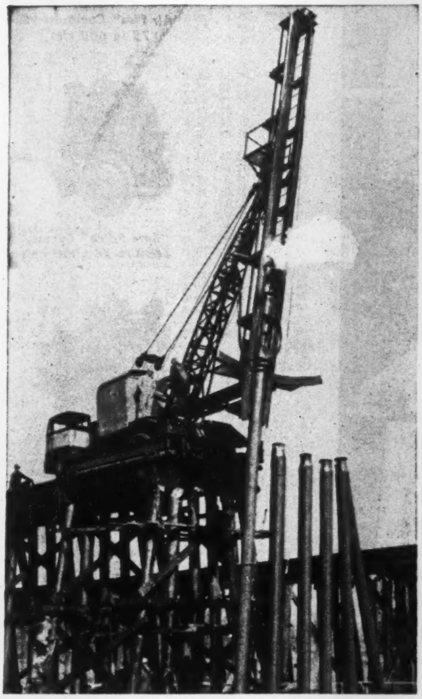
INLAND 4-WAY SAFETY PLATE

On scores of products, on new bridges, in new buildings—and for replacement, maintenance and repair—this scientifically designed steel floor plate, with its exclusive raised lug pattern, provides positive traction in every direction. Tough, durable, strong, it stands up under heavy loads and hard wear. It can be readily sheared, welded, punched, flame cut, and shaped. It has no pores, no cracks, absorbs no liquids and is easy to sweep. Comes in a wide variety of patterns and sizes. Write for Bulletin FI.



INLAND CREOSOTE OIL

For better, longer-lasting preservation of timbers and wood piling. Inland-owned-and-operated coal mines, coke ovens and tar distillation equipment assure quality control at every step in production of Inland Creosote Oil. Its low benzol insoluble content of about 0.1% (American Wood Preservers Association specifications permit 0.5%) gives clean, deep-penetrating, longer lasting preservation.

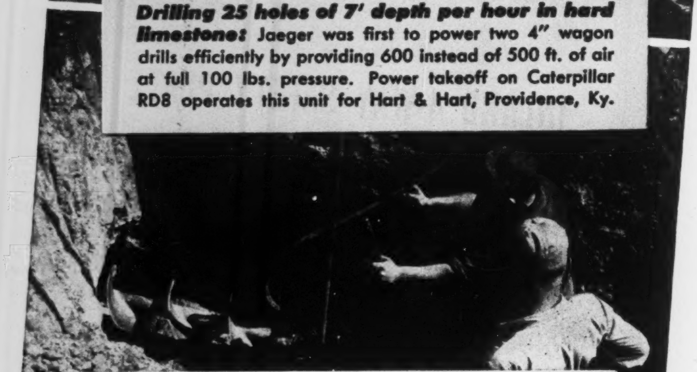
INLAND SHEET PILING

Taking the punishment of driving and pulling—being driven, pulled and re-driven as many as 15 times—Inland Sheet Piling has been used and depended on by piling contractors for more than 25 years. Made with highly efficient interlocks for water retention, it gives excellent service on single and double wall cofferdams, cellular breakwaters, jetties, docks, bulkheads and retaining walls. Rolled from a special analysis steel, with the strength, toughness and uniformity to withstand extreme and continued stresses. Available with all necessary sheet piling accessories. In Inland Copper-Alloy, at slight additional cost. And Inland sheet piling specialists with broad experience are available to help you on sheet piling problems. Write for Booklet SP2.

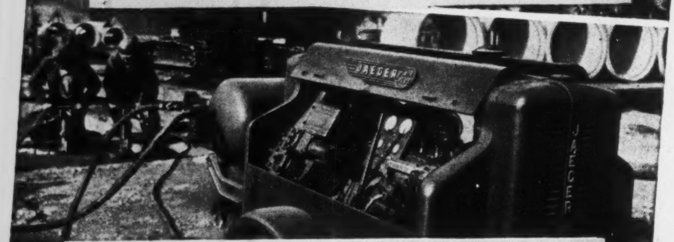
INLAND STEEL COMPANY
38 S. Dearborn Street, Chicago 3, Illinois

Jaeger's 15% to 25% more air means more work for wages paid

Drilling 25 holes of 7' depth per hour in hard limestone: Jaeger was first to power two 4" wagon drills efficiently by providing 600 instead of 500 ft. of air at full 100 lbs. pressure. Power takeoff on Caterpillar RD8 operates this unit for Hart & Hart, Providence, Ky.



125' of tunnel in 2¼ hours: Jaeger "new standard" Models 125, 250 and 365 are the only sizes that will efficiently operate 5, 10 and 15 hp air motors on Ka-Mo drills which require 110, 220 and 330 cfm of air (22 cfm per hp).

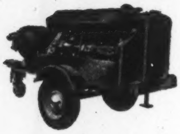


"Air Plus" Model 125 replaces old 160: Sewer contractors now run 2 heavy sheeting drivers at top efficiency with 125 cfm of 100 lb. air; drive sheeting as fast as with a 160 ft. compressor, and save the difference in cost.

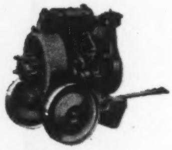
Want to cut your costs? See your Jaeger dealer, or send for Catalog JC-1

THE JAEGER MACHINE COMPANY
200 Dublin Ave., Columbus 16, Ohio
PUMPS • MIXERS • HOIST TOWERS • TRUCK MIXERS • PAVING MACHINES

MAKE MORE MONEY BY MAKING FULL USE OF YOUR JAEGER DISTRIBUTOR'S SERVICE

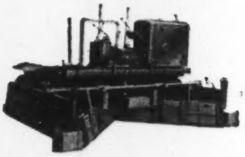


"Air Plus" Compressors,
75 to 600 cfm

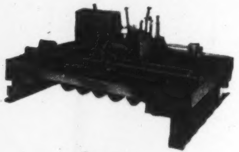


"Sure Prime" Pumps,
3600 to 240,000 gph

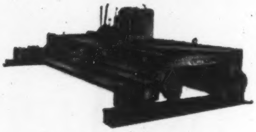
"Speedline" Mixers,
3½ S to 16 S



Paver-Type Aggregate Spreaders



Concrete
Screw-and-Screed Spreaders



Diagonal Screed Finishers

Equipment rental rates

Continued from page 135

Type of equipment		Rate per	
	hour	day	month
Pump unit, centrif, port, G 1½″	0.09	0.72	14.33
2″	0.25	1.96	39.24
4″, 30,000 gallons	0.50	3.99	79.77
4″, 40,000 gallons	0.75	5.96	119.12
6″	1.22	9.74	194.80
Roller, 2-wheel tandem, D			
6 to 8 tons variable	2.54	20.35	407.00
8 to 12 tons, variable	4.65	57.18	743.60
Roller, 3-wheel, 5 to 7½ tons. . D	2.54	20.35	407.00
9 to 11 tons. . . D	4.58	36.63	732.60
Roller, tamping, sheepsfoot			
4′ wide—single	0.96	7.65	153.01
8′ wide—double	1.40	11.18	223.63
12 to 15′ wide—triple	1.46	11.69	233.75
Roller, tamping, rubber-tired			
9-wh, tires 7.50 x 15—5′	1.23	9.81	196.19
13-wh, tires 7.50 x 15—7′	1.48	11.84	236.78
Scale, truck, 15 ton	0.68	5.45	108.90
25 ton	0.98	7.87	157.30
wheelbarrow, 1 beam	0.10	0.79	15.73
Scraper, cable or hydr. scoop pan pneu tires, without pwr unit			
struck 4 cy heaped 6 cy	1.52	12.16	243.10
str 6 cy, heap 8 cy	3.02	24.19	482.79
str 8 cy, heap 10 cy	3.71	29.65	592.90
str 10 cy, heap 12½ cy	4.13	33.03	660.66
str 12½ cy, heap 16.8 cy	4.77	38.17	762.30
str 16½ cy, heap 19½ cy	7.95	63.56	1,270.50
Shovels back hoes, D			
Crawler, ½ cy	8.13	65.04	1,300.86
¾ cy	10.59	84.70	1,694.00
1 cy	10.73	85.81	1,916.20
1½ cy	18.84	150.73	3,014.55
2 cy	23.28	186.20	3,724.05
2½ cy	29.70	237.60	4,752.00
Truck mounted, D ½ cy	10.04	80.30	1,606.00
¾ cy	13.67	109.35	2,387.00
Tamper, gas, see also air tools	0.67	5.35	106.92
Tractor, D, crawler, drawbar h.p.			
29 to 35, D-2 TD-6	2.25	18.07	361.35
35 to 50, D-4 TD-9	3.01	24.09	481.80
50 to 75, D-6 TD-14	4.08	32.67	653.40
78 to 90, D-7 TD-18	5.82	46.59	931.70
92 to 115, HD-15	6.88	55.06	1,101.10
117 to 175 D-8, TD-24, HD-20	11.12	88.94	1,778.70
4-Wh, rub tired, belt h.p.			
20 to 25	0.99	7.93	158.57
26 to 36	1.32	10.60	232.01
36 to 45	1.96	15.67	313.45
46 to 55	2.81	22.44	448.80
2-Wh, rub tired, with scraper brake h.p.			
120 to 145 (6–8 cy, 9 ton)	9.13	73.05	1,461.08
145 to 180 (8–11) cy	11.12	88.94	1,778.70
180 to 195	15.35	122.82	2,456.30
195 to 240 (13.5–18 cy.)	17.47	139.76	2,795.10
Tractor attachments, Acces winch, powr take-off,			
Single drum	0.80	6.39	127.88
Double drum	1.28	10.23	204.60
Bulldozer, for tractor h.p.			
29 to 35, hydr	1.10	8.83	176.55
35 to 50, hydr	1.34	10.74	214.87
50 to 75, cable	0.83	6.65	132.99
78 to 90, cable	0.94	7.48	149.60
90 to 115, cable	1.06	8.47	169.40
117 to 175, cable	1.32	10.59	211.75
Front end loader buckets ½ cy	1.10	8.83	176.55
¾ cy	1.40	11.22	224.40
1 cy to 1¼ cy	2.46	19.64	392.70
1½ cy to 2 cy	3.20	25.58	511.50
Trenching machine, lad & vert boom type, max. mfg. rating			
Dp 8′ 3″, wd 18″–24″ . . . D	10.83	86.63	1,732.50
G	8.66	69.30	1,386.00
Dp 10′–14′, wd 10″–30″ . . . D	11.77	94.12	1,882.38
G	10.72	85.76	1,715.18
Dp 10′–14′, wd 30″–42″ . . . D	12.04	96.35	1,926.93
G	11.25	89.99	1,799.88
Wheel type, dp 6½′–8½′ . . . D	25.93	227.45	4,549.05

Recommended by Colorado Contractors Assoc., Inc., Mar. 1, '52

Total hourly rates shown are without operators. This includes everything in the way of insurance and overhead and no percentage should be added.

For monthly rates use 25 8-hour, single operating shift days. For double or triple shifts, charge 50% of the bare rental rate plus operating service rate for each additional shift of 8 hours.

Type of equipment			Rental rate, per hr		
			bare	service	total
Air compressor, self-contained power unit, portable (Bare rental incl all nec air receivers, air hose and fittings)	G	60 cfm	1.05	1.15	2.20
	G	105 cfm	1.60	1.45	3.05
	G	160 cfm	2.20	2.00	4.40
	G	210 cfm	2.50	2.45	4.95
	G	315 cfm	3.30	3.75	7.05
	D	105 cfm	2.05	0.75	2.80
	D	160 cfm	2.70	0.90	3.60
	D	210 cfm	3.05	1.05	4.10
	D	315 cfm	3.90	1.65	5.55
	D	500 cfm	5.15	1.90	7.05
	D	600 cfm	5.75	2.55	8.30
Air Tools tampers	Single unit		0.10	....	0.10
Backfill tampers	Three unit		0.30	....	0.30
Clay spades	All		0.10	....	0.10
Drifters & mounting	All		0.40	....	0.40
Jack hammer	to 50# incl.		0.15	....	0.15
	51#–68# ″		0.20	....	0.20
	69#–80# ″		0.25	....	0.25
Paving breaker	to 69# incl.		0.15	....	0.15
	70#–80# ″		0.20	....	0.20
Wagon drill	All		0.70	....	0.70
Grader, self prop (used as a scarifier or blade)	G	31– 35 hp	1.60	3.40	5.00
	G	70– 85 hp	3.55	4.30	7.85
	G	80– 90 hp	4.10	4.55	8.65
	D	100–130 hp	4.60	4.15	8.75
	D	75– 90 hp	4.05	3.85	7.90
	D	60– 74 hp	3.80	3.55	7.35
	D	45– 59 hp	3.25	3.10	6.35
Pumps, portable, (Includes power, self-contained or otherwise and all valves and hose)	1½″	3M gpm	0.10	0.70	0.80
	2″	7M gpm	0.15	0.90	1.05
	2″	10M gpm	0.20	1.10	1.30
	3″	15M gpm	0.20	1.35	1.55
	3″	20M gpm	0.25	1.45	1.70
	4″	30M gpm	0.40	1.75	2.15
	4″	40M gpm	0.55	1.85	2.40
	6″	90M gpm	0.95	2.45	3.40
Roller, steel wheel, self-pwrd (by mfr's rated capacity in tons)	G, Tandem	5–8t incl.	1.40	1.30	2.70
	Tandem	8.1–10.5t	1.55	1.60	3.15
	Tandem	10.6–12t	1.70	1.80	3.50
	G, 3-axle	12.1–19t	2.50	2.40	4.90
	G, 3-wheel	5–7t	1.50	1.30	2.80
	3-wheel	7.1–9t	1.65	1.50	3.15
	3-wheel	9.1–12t	2.00	1.70	3.70
	3-wheel	12.1t over	2.20	2.35	4.55
	D, Tandem	5–8t	1.70	1.20	2.90
	Tandem	8.1–10.5t	1.85	1.50	3.35
	Tandem	10.6–12t	2.00	1.70	3.70
	D, 3-axle	12.1–19t	2.75	2.30	5.05
	D, 3-wheel	5–7	1.75	1.20	2.95
	3-wheel	7.1–9	1.90	1.40	3.30
	3-wheel	9.1–12	2.25	1.60	3.85
	3-wheel	12.1 over	2.50	2.30	4.80
*Roller, pn tr, towd, str or wob whl		9-wh to 8t	0.70	0.10	0.80
	10–13 wh	8.1 to 12t	0.90	0.10	1.00
		10–13 wh 50t	4.70	0.20	4.90
*Roller,tmpg, shpsft, 2 drum 60″x60″			1.45	0.20	1.65

* Add traction unit for complete operatable unit.

‡Scrapers, drn (by mfr's, rated capacity in cu yds)	struck	heaped	bare	service	total
	2–5 cy	2.5– 6 cy	1.30	0.55	1.85
	5.1–10	6.1–12.5	2.25	0.85	2.10
	10.1–15	12.6–18.5	3.05	1.15	4.20
	15.1–20	18.6–25.0	4.35	1.30	5.65
	20.1 over	25.1 over	5.75	1.70	7.45

(For complete earth moving unit, fully maintained, the total hourly rates for these items should be added together: tractor of size used, incl. service charge; power unit of type used; scraper of size used, incl. service charge)

‡ See also 2-wheel tractor and scraper unit under tractors

Type of equipment			bare	service	total
Shovel, crawler (as crane, clamshell, dragline, orange peel, paving breaker or pile driver. Boom length recommended by manufacturer)	G	⅜ cy	3.65	3.55	7.20
	G	½	4.20	3.95	8.15
	G	¾	5.30	4.75	10.05
	G	1	6.70	5.35	12.05
	G	1¼	8.70	5.90	14.60
	G	1½	10.50	6.80	17.30
	D	⅜	4.00	2.15	6.15
	D	½	4.65	3.45	8.10
	D	¾	5.50	4.00	9.50
	D	1	7.20	4.60	11.80
	D	1¼	9.15	5.35	15.50
	D	1½	10.30	5.80	16.10
	D	2	14.75	6.95	21.70
	D	2½	15.65	7.90	23.55
Shovel, truck (as crane, clamshell, dragline, orange peel, paving breaker or pile driver)	G	¼ cy	2.50	3.30	5.80
	G	⅜	4.80	3.55	8.35
	G	½	6.05	3.95	10.00
	G	¾	8.30	4.75	13.05
	G	1	10.00	5.60	15.60
	D	½	6.50	3.30	9.80
	D	¾	8.50	4.05	12.55
	D	1	10.60	4.90	15.50
	D	1¼	12.95	5.80	18.75

(On pile driving, add rates for leads and hammer)

Type of equipment			bare	service	total
Shovel, crawler (as shovel or backhoe, boom length recommended by mfg.)	G	⅜cy	3.80	3.55	7.35
	G	½	4.40	3.95	8.35
	G	¾	5.60	4.75	10.35
	G	1	7.20	5.35	12.55
	G	1¼	9.25	5.90	15.15
	G	1½	11.25	6.80	18.05
	D	⅜	4.20	2.15	6.35
	D	½	4.95	3.45	8.40
	D	¾	5.90	4.00	9.90
	D	1	7.70	4.60	12.30
	D	1¼	9.65	5.35	15.00
	D	1½	11.30	5.80	17.10
	D	2	15.70	6.95	22.65
	D	2½	17.35	7.90	25.25
Shovel, truck (as shovel or backhoe)	G	¼	2.60	3.30	5.90
	G	⅜	5.00	3.55	8.55
	G	½	6.40	3.95	10.35
	G	¾	8.60	4.75	13.35
	G	1	10.85	5.60	16.45
	D	½	6.90	3.30	10.20
	D	¾	8.80	4.05	12.85
	D	1	11.80	4.90	16.70
Tractor crawler		drawbar			
OC-3 AC-6 T-6	G	20–31 hp	1.45	2.75	4.20
BG T-9	G	32–41 hp	1.55	2.75	4.30
DG	G	53–75 hp	2.00	3.95	5.95
Tractor crawler		drawbar			
TD-6	D	20–31 hp	1.25	2.20	3.45
BD HD-5 TD-9 D-2	D	32–41 hp	1.60	2.20	3.80
D-4	D	42–52 hp	1.80	2.75	4.55
DD D-6 T-D 14A HD-9	D	53–75 hp	2.70	3.55	6.25
D-7 TD-18A HD-15	D	76–114 hp	3.85	4.20	8.05
D-8 FDE	D	115–140 hp	4.80	5.10	9.90
HD-20 TD-24	D	141–165 hp	6.05	6.55	12.60
Tractor acces, angle or bull dozer, rooter or ripper (by tractor size)		20–41 hp	0.70	....	0.70
		42–75 hp	0.75	....	0.75
		76–140 hp	0.85	....	0.85
		141 hp-over	1.25	....	1.25
Power control unit (Either hydr or cable control)		20–41 hp	0 25	....	0.25
		42–75 hp	0.45	....	0.45
		76–140 hp	0.60	....	0.60
		141 hp-over	0.70	....	0.70
Tractor, 4-wheel rubber tire	G	16–24 hp	0.60	2.45	3.05
	G	25–35 hp	0.75	2.75	3.50
	G	36–46 hp	1.10	3.00	4.10
	G	61–75 hp	1.45	3.30	4.75
	D	36–46 hp	1.45	1.90	3.35
DW-10	D	104–125 hp	3.90	2.60	6.50
DW-20, 70-FDT	D	189–226 hp	5.85	3.35	9.20
8-TDT	D	250–275 hp	6.95	4.65	11.60
18-LDT	D	276 hp-over	8.25	5.40	13.65
Tractor, 2-wh (incl mfgr's rtd scraper)	D	101–145 hp	5.20	3.65	8.85
	D	146–160 hp	8.70	4.10	12.80
	D	161–250 hp	10.05	5.45	15.50
Truck, exc dump (by mfr's capacity, tons)	FPS	to ¾t	0.65	....	1.30
	FPST	1t	0.70	....	1.40
	FSTW	1½t	0.75	....	1.50
	FSTW	2t	0.90	....	1.80
	FSTW	2½t	1.30	....	2.60
	FSTW	3t	1.75	....	3.50
	FSTW	3½t	1.95	....	3.90
	FSTW	4–4½t	3.15	....	5.50
	T	5t	4.10	....	7.20
	T-Tandem, D	10t-over	6.40	....	9.60
†Trucks, dump (by net weight in 100-lbs, also by water-level measure in cy)	to 8.1 cwt	to 2.9 cy	1.05	....	2.10
	8.2–10.9	3.0– 3.9	1.10	....	2.20
	11–13.7	4.0– 4.9	1.25	....	2.50
	13.8–16.5	5.0– 5.9	1.50	....	3.00
	16.6–19.3	6.0– 6.9	1.95	....	3.40
	19.4–22.1	7.0– 7.9	2.45	....	4.30
	22.2–27.7	8.0– 9.9	3.00	....	5.25
	27.8–30.5	10.0–10.9	4.15	....	7.25
Winch		all sizes	....	....	0.30
Tract trails, end, bot or		15–19t	1.80	0.80	2.60
side dump, DW-10		20–24t	2.20	1.05	3.25
89-W		25–35t	3.50	1.70	5.20
DW-20		36–40t	4.70	2.00	6.70
105-W		10–19t	1.80	0.25	2.05
Float, drop-center lowboy		20–34t	2.00	0.45	2.45
		35–50t	2.40	0.70	3.10

† Add truck, tractor being used for complete unit

Type of equipment			bare	service	total
Tanker, insul		1000 gal	0.45	0.20	0.65
		2000 gal	0.65	0.25	0.90
		3000 gal	1.10	0.30	1.40
		5000 gal	2.50	0.45	2.95
Non-insulated		1000 gal	0.35	0.20	0.55
		2000 gal	0.55	0.25	0.80
		3000 gal	0.65	0.30	0.95
		5000 gal	2.25	0.45	2.70

*D diesel *G gas *t tons

Recommended by Assoc. General Contractors of Iowa, June 18, 1952

Hourly rental rates shown here include fuel, oil, grease, tires, repairs, etc., and are the total rental price per hour. Equipment shown "with operator" means that the wages of one operator are included in the rental rate for the equipment. No percentage is to be added to any of the hourly rates in calculating an agreed price on extra work.

Without operator

Type of equipment	Per hour
Air compressor, 60 cf	$2.00
160 cf	4.00
210 cf	5.50
315 cf	7.50
Air tools, all types, per tool	0.75
Mixer, conc—incl small tools & scales, 10S or 11S	4.25
16S	5.50
Pumps, 2″ and 3″ with hose	2.50
4″ with hose	4.00
6″ with hose	6.00
Wagon drill	3.50

With one operator

Crane, shovel or dragline, with nec attach: bucket and/or drop hammer pile driving equip			
Up to and incl ½-yd Crawler	$10.00	Rubber	12.00
¾-yd Crawler	12.00	Rubber	14.00
1-yd Crawler	.....	......	16.00
1½-yd Crawler	.....	......	18.00
Motor grader, 610, AD-4, 99, 12, 116, 403 or 404			12.00
414 or 512, D-4, 99H, 112, 102 or D-76			10.00
312, 11, 211 or 212, 202 VD-800			9.00
Pile driving unit, steam, compl except crane			18.00
Pull blade			5.00
Rototiller or pulvi-mixer, plain, (oper on pull unit)			3.75
Tractor, crawler, plain, HD-15, D-8 & HD-14			13.00
HD-19, HD-20 & TD-24			15.00
HD-10, HD-9, D-7, TD-18			10.50
HD-7, D-6, TD-14, DD or DG			8.50
HD-5, D-4, TD-9, BD or BGS			7.00
eq with dozer or shft rlr, HD-15, D-8 & HD-14			16.00
HD-19 & TD-24			18.00
equipped with scraper HD-15, D-8 & DD-14			18.00
HD-19 & TD-24			20.00
eq with dozer, scraper, fr end ldr or shft rol, HD-10, HD-9, D-7, TD-18			13.50
HD-7, D-6, TD-14, DD or DC			11.50
eq with dozer, scr, fr end ldr, shft or ru t rlr, HD-5, D-4, TD-9, BD or BGS			8.50
Tractor, cr or r t, pl, D-2, TD-6, AD or AG or farm			5.50
eq with dzr, scr, fr end ldr, shft or r t rol or disc			7.00
Tractor, hvy duty rub tired, pl Cat DW-10 or Euc.			10.00
eq with shft roller, r t rlr or disc			11.50
Tractor, heavy duty rubber tired, Cat DW-10, Euc, LeTour C or Super C, pulling scraper			15.00
Tractor, Cat DW-20, LaPl Ch, motor scraper or LeTour, mod B pulling scraper			22.00
Trucks, with driver, 1½–2-ton			4.25
with winch			5.50
2½–3-ton			6.00
Welder, port, also incl. weld rod, 200 amps			5.50
300 amps			7.00

HOUSING PROJECT in Chester, Pa., consists of 43 two-story buildings, each 157x26 ft, and will be completed in 15 months.

PLAN OF OPERATION—Before starting, sequence of construction was planned carefully, taking into account accessibility from streets, direction of utility installations, and location of materials, sheds and offices.

Scheduling work to control housing costs

COSTS PER SQUARE FOOT

Ruth L. Bennett Terrace Homes, Chester, Pa.

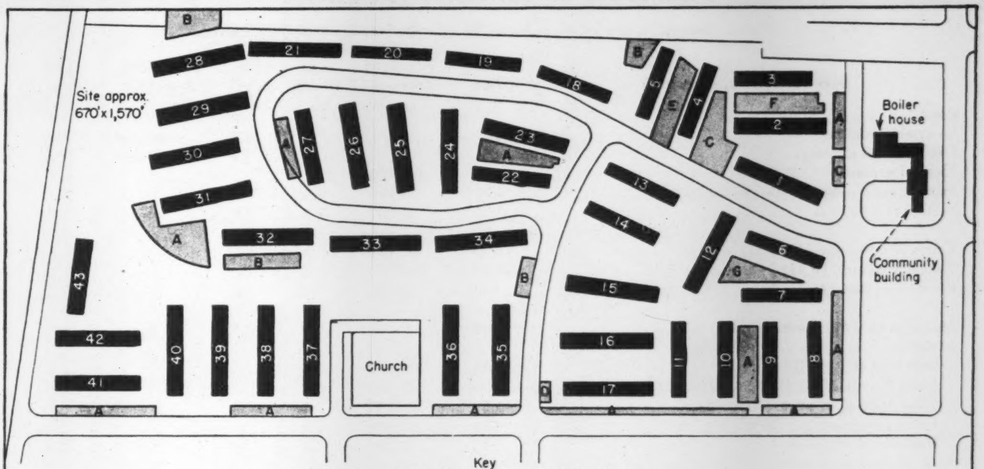
Total of 174,700 sq ft:
43 2-story dwellings....167,950 sq ft
Boiler house........... 2,600 sq ft
Community building.... 4,150 sq ft

Item	Amount	Cost per sq ft
Excavation & backfill	$68,520	$0.39
Concrete foundations	63,182	0.36
Concrete superstr., reinf. steel, & str. steel	207,598	1.19
Masonry, brick & concrete block	615,000	3.52
Rough carpentry	353,110	2.02
Finish carpentry	196,890	1.13
Lath & plaster	260,000	1.49
Floors	55,500	0.32
Painting & decorating	45,000	0.26
TOTAL OF SELECTED ITEMS (Percent of all structure items 81.8%)	$1,864,801	
TOTAL STRUCTURE	2,281,000	$13.06
HEATING	437,437	2.50
PLUMBING	351,412	2.01
ELECTRICAL	174,639	1.00
TOTAL WITH MECHANICALS	$3,244,488	$18.57
Site improvements	282,000	1.61
TOTAL FOR ALL CONSTRUCTION	$3,526,488	$20.18

Faced with the task of a multi-building project, one of the shrewdest general contractors in the business, Psaty & Fuhrman, Inc. of New York City, takes great pains in drawing up a "Plan of Operation" and a "Work Schedule" before allowing a single piece of equipment on the site. Charts of its operation plan and work schedule are reproduced here for the $3.5 million Ruth L. Bennett Terrace Homes project in Chester, Pa. And since the proof of the pudding is in the cost, square foot figures (on this page) and itemized contract amounts and percentages (on p. 142 of this issue) are also shown.

P&F is constructing the 43 two-story garden apartment buildings, which comprise the project, on a 24-acre site. A typical unit is 157 ft long, 26 ft wide and 16 ft 9 in. high. Ground and first floors are generally concrete slabs, second floors and roofs wood, while walls are 8-in. masonry. There will be 390 individual dwelling units: 48 1-bedroom, 220 2-br, 98 3-br, and 24 4-br.

Work started in September, 1951, and will be completed this December. Owner of the PHA-financed project is the Chester Housing Authority. Louis Doane was structural engineer, G. Morris Whiteside, architect. Prime contractors besides Psaty & Fuhrman are: Daniel J. Keating Co., Philadelphia, heating; Wilson Bros., Collingsdale, Pa., plumbing; and Progressive Electric Construction Co., Philadelphia, electrical.


Site approx. 670'x1,570'
Boiler house
Community building
Church
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43
A B C D E F G

Key
A–Materials and shanties
B–Top soil storage
C–GC subcontractors
D–GC field office
E–Heating contractor
F–Plumbing contractor
G–Electrical contractor

Buildings	1951 September	1952 April	May	June	July	August
Footing Excavation	BH 1	2 3 4 38 39	40 41 42 43			
Concrete Footings	BH	1 2 3 4	39 40 41 42 43			
Structural Steel		BH				
Block Foundations		BH 1 2 3 4	5 39 40 41 42	43		
Radial Brick Chimney		BH				
Slabs on Ground (mech space)		1 BH 2	3 4 5 40 41	42 43		
1st Floor Concrete Slabs		1	BH 2 3 4	40 41 42 43		
1st Floor Framing			1 BH 2 3 4	40 41 42 43		
1st Floor Masonry			1 BH 2 3	4 39 40 41 42	43	
1st Floor Partitions			1 BH 2	3 39 40 41	42 43	
2nd Floor Framing			1	1 BH 2 3 39	40 41 42 43	
2nd Floor Masonry				1 BH 2 3 38	39 40 41 42 43	
2nd Floor Partitions				1 BH 2	38 39 40 41 42	43
Roof Framing (inc. concrete plank)				1 BH 2	38 39 40 41	42 43
Roofing and Sheetmetal					1 BH 2 37 38 39	40 41 42 43

Note: Numbers indicate building numbers; Position of each number designates starting time of item.

BH Represents boiler house and comm. bldg.

WORK SCHEDULE—The plan above was elaborated as definite starting dates for each construction phase on each unit were figured a full month before any work began. Contractor reports that the schedule has been followed closely.

MATERIAL LOCATIONS are accessible, do not interfere with utility installations, and serve a convenient group of buildings.

(Continued on p. 142)

SCHEDULE OF CONTRACT PAYMENTS

Ruth L. Bennett Terrace Homes, Chester, Pa. (Chester Housing Authority, owner)

Item (Quantity, measure)	Unit price	Sub item amount	% of struct	% of struct	Main item Amount	% of total
Bond	LS			1.0	$22,554	0.6
General conditions	LS			4.7	106,296	3.0
Demolition & clearing	LS			0.4	10,000	0.3
General excavation (7,200 cy)	1.35	$9,720	0.4			
Footing excavation (13,300 cy)	4.00	53,200	2.3			
Backfill (11,200 cy)	0.50	5,600	0.3	3.0	68,520	1.9
Concrete foundations (935 cy)	67.30	63,182	2.8			
Concrete superstr. (2,721 cy)	67.30	183,123	8.0			
Reinforcing steel (45 tons)	400	18,000	0.8	11.6	264,305	7.5
Structural steel (18.5 tons)	350			0.3	6,475	0.2
Masonry:						
Brickwork (1,741M)	175	304,675	13.4			
Conc. founda. block (129,500 sf)	1.09	141,155	6.2			
Conc. back-up block (155,500 sf)	0.55	85,525	3.7			
Conc. partition block (79,600 sf)	0.80	63,680	2.8			
Radial brick chimney	LS	19,965	0.9	27.0	615,000	17.4
Misc. & ornamental metal	LS			3.1	70,000	2.0
Metal windows	LS			2.9	65,000	1.8
Roofing & sheet metal	LS			3.9	90,000	2.6
Rough carpentry:						
Floor & roof framing (600 mbm)	240	144,000	6.3			
Stud partitions (229 mbm)	270	61,830	2.7			
Underflooring (210 mbm)	240	50,400	2.2			
Roofers (216 mbm)	240	51,840	2.3			
Wall furring & grounds (292,000 lf)	0.12	35,040	1.6			
Thermal insulation	LS	10,000	0.4	15.5	353,110	10.0
Metal bucks	LS			0.4	10,000	0.3
Calking	LS			0.3	6,000	0.2
Lath & plaster	LS			11.4	260,000	7.4
Finish carpentry:						
Millwork	LS	149,660	6.6			
Stairs	LS	30,000	1.3			
Cabinets, accessories	LS	17,230	0.7	8.6	196,890	5.6
Finish hardware	LS			0.4	9,350	0.2
Glass & glazing	LS			0.4	10,000	0.3
Floors:						
Wood	LS	50,000	2.2			
Asphalt & ceramic tile	LS	5,500	0.2	2.4	55,500	1.6
Painting & decorating	LS			2.0	45,000	1.3
Screens	LS			0.7	17,000	0.5
TOTAL STRUCTURE				**100.0**	**$2,281,000**	**64.7**
Sanitary sewers	LS				75,000	2.1
Water distribution system	LS				42,000	1.2
Street work	LS				90,000	2.6
Yard work	LS				35,000	0.9
Site excavation & fill	LS				37,000	1.0
Final cleanup	LS				3,000	0.1
TOTAL FOR GENERAL CONSTRUCTION					**$2,563,00**	**72.6**
HEATING					437,437	12.4
PLUMBING					351,412	10.0
ELECTRICAL					174,639	5.0
TOTAL FOR ALL CONSTRUCTION					**$3,526,488**	**100.0**

JENKINS PRACTICAL PIPING LAYOUTS 62

SCHEDULE OF VALVE POSITIONS FOR COMPLETE CYCLE OF OPERATION

Operation	A	B	C	D	E	F	G	H
Softening	Open	Open	Close	Close	Close	Close	Close	Open
Backwashing	Open	Close	Open	Open	Close	Close	Close	Close
Brining	Open	Close	Close	Close	Open	Open	Open	Close
Rinsing	Open	Open	Close	Close	Close	Close	Open	Close

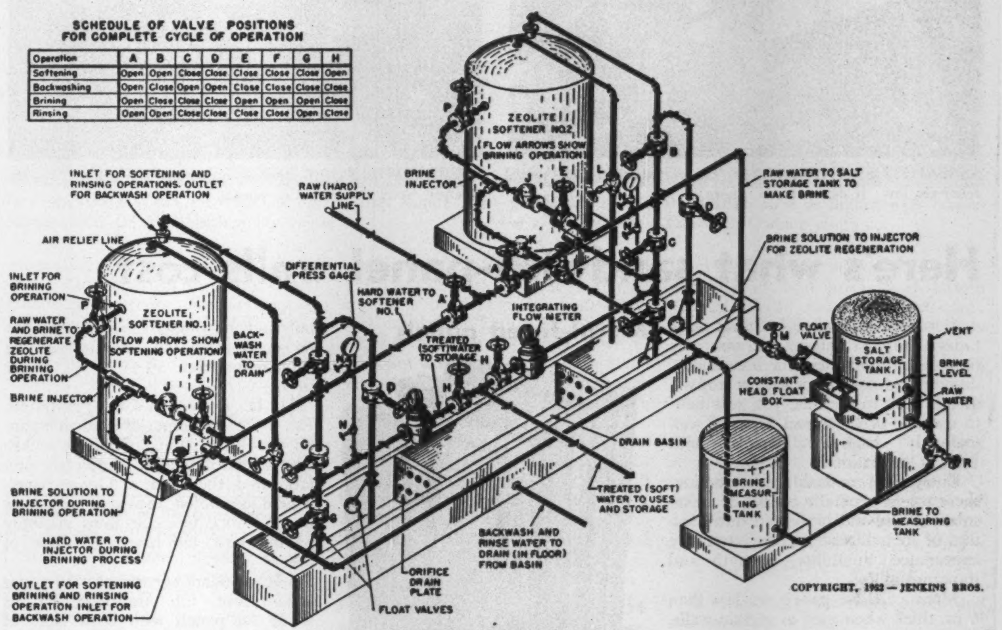

INLET FOR SOFTENING AND RINSING OPERATIONS. OUTLET FOR BACKWASH OPERATION
AIR RELIEF LINE
INLET FOR BRINING OPERATION
RAW WATER AND BRINE TO REGENERATE ZEOLITE DURING BRINING OPERATION
BRINE INJECTOR
ZEOLITE SOFTENER NO.1 (FLOW ARROWS SHOW SOFTENING OPERATION)
BACK-WASH WATER TO DRAIN
RAW (HARD) WATER SUPPLY LINE
DIFFERENTIAL PRESS GAGE
HARD WATER TO SOFTENER NO. 1
TREATED (SOFT) WATER TO STORAGE
INTEGRATING FLOW METER
BRINE INJECTOR
ZEOLITE SOFTENER NO.2 (FLOW ARROWS SHOW BRINING OPERATION)
RAW WATER TO SALT STORAGE TANK TO MAKE BRINE
BRINE SOLUTION TO INJECTOR FOR ZEOLITE REGENERATION
FLOAT VALVE
VENT
SALT STORAGE TANK
BRINE LEVEL
RAW WATER
CONSTANT HEAD FLOAT BOX
DRAIN BASIN
TREATED (SOFT) WATER TO USES AND STORAGE
BRINE MEASURING TANK
BRINE TO MEASURING TANK
BRINE SOLUTION TO INJECTOR DURING BRINING OPERATION
HARD WATER TO INJECTOR DURING BRINING PROCESS
OUTLET FOR SOFTENING BRINING AND RINSING OPERATION INLET FOR BACKWASH OPERATION
ORIFICE DRAIN PLATE
FLOAT VALVES
BACKWASH AND RINSE WATER TO DRAIN (IN FLOOR) FROM BASIN
A
B
C
D
E
F
G
H
J
K
L
M
N
P
R

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Diagram by Huxley Madeheim
Consulting Engineer

How to plan a ZEOLITE (BASE EXCHANGE) WATER SOFTENING SYSTEM

Diagram shows piping connections for a zeolite water softening system (removal of hard water impurities). Twin softening units permit one to operate while the other is being regenerated, (replacing used sodium in the zeolite).

The complete cycle consists of softening, backwashing, brining, and rinsing. After a certain amount of raw water has been softened, the sodium in the zeolite is used up. The process is then stopped by operating the valves as indicated in the schedule, and the other softening unit is put into operation.

The zeolite is regenerated, after the backwash operation (first step in regeneration of softener), by replacing accumulated calcium and magnesium with the sodium by running through a brine solution. The zeolite is then rinsed after correct amount of brine solution has been admitted.

The rinsing operation also removes any remaining brine, making the softener ready for re-use when needed. Depending upon the chemical composition of the water, either iron-body bronze-mounted or all-iron valves are recommended on all lines conducting the water before it is completely treated.

Consultation with piping engineers is recommended when planning any major piping installations.

To save time, to simplify planning, to get all the advantages of Jenkins specialized valve engineering, select all the valves you need from Jenkins complete line. It's your best assurance of *lowest cost in the long run.* Jenkins Bros., 100 Park Ave., New York 17.

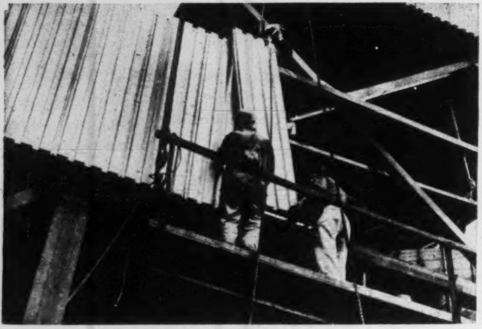
Complete description and enlarged diagram of this layout free on request. Includes additional detailed information. Simply ask for Piping Layout No. 62.

VALVE RECOMMENDATIONS
For details of valves to suit varying conditions, see Jenkins Catalog

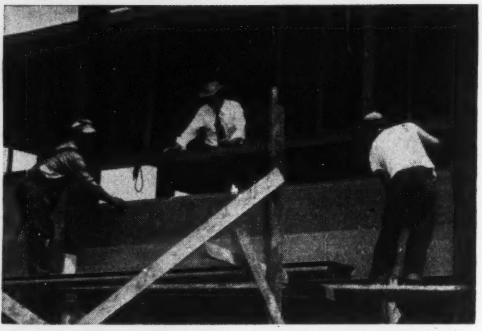
Code	Quan.	JENKINS VALVES	SERVICE
A	2	Fig. 651 I.B.B.M. Gate or Fig. 100 All Iron Gate	Raw Water Supply to Softener
B	2	Fig. 651 I.B.B.M. Gate or Fig. 100 All Iron Gate	Control of Cycle Operations
C	2	Fig. 651 I.B.B.M. Gate or Fig. 100 All Iron Gate	Control of Cycle Operations
D	2	Fig. 651 I.B.B.M. Gate or Fig. 100 All Iron Gate	Backwash Drain Line
E	2	Fig. 100 All Iron Gate	Injector Water Shutoff
F	2	Fig. 40-A All Iron Gate	Brine Control to Injector
G	2	Fig. 651 I.B.B.M. Gate	Brine and Rinsing Operation Drain
H	2	Fig. 651 I.B.B.M. Gate	Softened Water Shutoff
J	2	Fig. 624 I.B. Swing Check or Fig. 85 All Iron Swing Gate	Prevent Backflow
K	2	Fig. 623 I.B. Swing Check or Fig. 85 All Iron Swing Gate	Prevent Backflow
L	2	Fig. 106-A Bronze Globe	Air Release
M	1	Fig. 106-A Bronze Globe	Water Supply for Brine
N	4	Fig. 743-G Bronze Needle	Pressure Gage Control
P	2	Fig. 100 All Iron Gate	Brine Connection Shutoff at Softener
R	1	Fig. 40-A All Iron Gate	Brine to Measuring Tank

JENKINS
LOOK FOR THE DIAMOND MARK
VALVES

Jenkins Bros



ASBESTOS-CEMENT PANELS for curtain walls are priced relatively low. (Celotex Corp. photo)



STEEL PANELS with built-in insulation are erected swiftly. (Detroit Steel Products Co. photo)

Here's what sandwich-panel walls cost

You can get better building walls today than ever before. And you may be able to build them for less money, despite the inflated value of today's dollar. But to do this, you will have to use one of the newer types of wall materials — large-size panels with built-in insulation.

Known as sandwich construction, these panels generally consist of an insulating core and inner and outer facings of materials chosen for attractive appearance, durability, strength and impermeability.

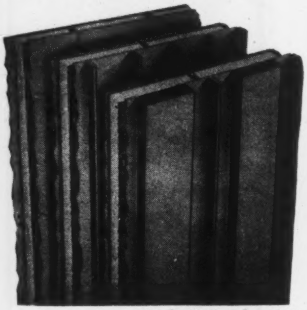
Many of these panels are less than 6 in. thick when used as curtain walls. In comparing their cost with conventional construction, which may be 8 to 12 in. thick, you should take into account the value of the extra floor area made available by the thin panels. Also, evaluate the effect of their light weight, which makes possible lighter structural members.

The largest item of economy, however, appears to result from prefabrication of the panels, which offers the advantages of mass production. Other factors of importance affecting economy include low maintenance and speedy, low-cost erection.

Determination of the cost of a sandwich panel in place involves the evaluation of a number of factors. Most important is cost of fabrication or, in the case of manufactured panels, the purchase price. Then there are the costs of transportation, storage, hoisting, fasteners, flashing, calking and girts or spandrel beams. Furthermore, contractor's overhead, insurance and profit must be included. All these costs vary with the type of panel and the location of the building to be enclosed.

Some idea of what this type of construction costs, however, may be obtained from the following data:

Metal-faced panels



R. C. Mahon Co. photo

Detroit Steel Products Co., Detroit, Mich., produces a non-loadbearing sandwich panel composed of two metal members pressed together with felt at each side. The interior space thus formed is filled with glass fiber. Felt is folded between the two metal members to prevent through metal contact and to isolate dissimilar metals. It also seals interlocking joints of adjoining panels.

These units are supplied in a thickness of 3 in. and width of 16 in. Length varies to meet job requirements up to a maximum of 14 ft. Panels are made with both faces of 18-ga steel, both faces of 16-ga aluminum, or one face steel, the other, aluminum. They are designed to be bolted or welded in place. Overall coefficient of heat transfer, or U value, is about 0.20. (A 12-in. brick wall has a U value of 0.36.)

Cost per square foot, fob Baltimore, Md., is $1.25 for the all-steel panel, $2.05 for the all-aluminum panel and $1.75 for the aluminum-steel panel. These prices include the fittings, details and sheet-metal closures necessary on an average job. Panels may be erected for from $0.45 to $0.60 per sq ft.

H. H. Robertson Co., Pittsburgh, Pa., makes two types of sandwich panels, which the company calls Q panels. The standard type is completely prefabricated; the other, or G-type panel, is field assembled. Insulated with glass fiber or rock wool, sections are only 3¼ in. thick, but have a U value of 0.16.

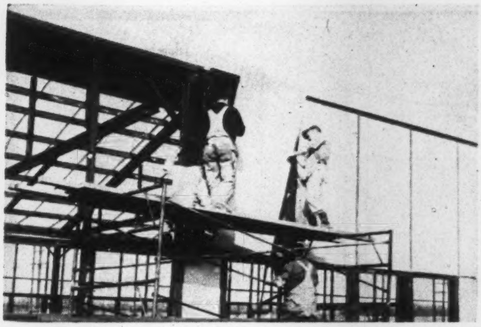
For standard Q panels, cost per square foot, fob Ambridge, Pa., is $1.35 for panels with both faces of metallic-coated steel plus $0.10 for flashings, and $0.70 for erection; $1.90 for panels with an aluminum exterior and steel interior plus $0.15 for flashings, and $0.75 for erection; and $2.75 for panels with stainless steel exterior and metallic-coated steel interior, plus $0.25 for flashings, and $0.85 for erection.

For G-type Q panels, cost per square foot is $1.30 for protected-metal V-beam exterior and steel interior, plus $0.15 for flashings, and $0.65 for erection.

The R. C. Mahon Co., Detroit, Mich., also manufacturers field-assembled and prefabricated panels, insulated with glass fiber. Supplied in 12-in. width, panels are fastened in place with an S clip welded to a girt and hooked over a male rib of a panel.

Standard 3¼-in. thick field-constructed panels have a U factor of 0.15; standard 3¼-in. prefabricated panels, a U of 0.25. There is also a prefabricated 1⁹⁄₁₆-in. thick panel with a U of 0.45.

Material costs per square foot for a field constructed wall are estimated to be $2.00 for panels with zinc-coated steel facings, $2.30 for alum-



ALUMINUM-FACED PANELS are lighter, may require less maintenance. (H. H. Robertson Co. photo)

CONCRETE-FACED PANELS serve as bearing walls (above) or as curtain walls. (Pittsburgh Corning photo)

inum-steel panels and \$3.85 for panels with stainless steel exteriors, zinc-coated steel interior. For similar prefabricated walls, costs are \$2.05, \$2.35 and \$3.90, respectively. For the $1\frac{9}{16}$-in. panel, they are \$1.85 for 18-ga steel and \$1.75 for 20-ga. Erection costs are not available.

U. S. Plywood Corp., New York, N. Y., produces 2-in. thick metal-faced panels with a honeycomb insulation core made of resin-impregnated paper. The U value is 0.275, but it may be improved by filling the honeycomb with insulation. Perlite fill, for example, will bring the U factor down to 0.18, but will add approximately \$0.35 per sq ft to the cost of the panel. Sizes of panels range up to 5 x $10\frac{1}{2}$ ft.

Material costs per square foot are \$3.80 to \$4.00 for 18-ga porcelain enamel on two sides; \$2.85 to \$3.00 for porcelain enamel on one side, 24-ga zinc-coated steel on the other; \$1.70 to \$1.85 for 24-ga zinc-coated steel on two sides; and \$1.80 to \$1.95 for 0.032-in. mill finish 3S aluminum facings. With stainless steel facings, costs are estimated to be close to those for porcelain enamel.

Uniwall, a porcelain-enamel panel with vermiculite or Johns-Manville's Marinite A insulation, was designed by William Lescaze and Robert L. Davison, architects, New York City, in 1947. At that time, the 48 x 52-in. x $3\frac{1}{2}$-in. thick panel, which has a U value of 0.221, was estimated to cost \$1.275 per sq ft fob point of manufacture. Erection would add \$0.231.

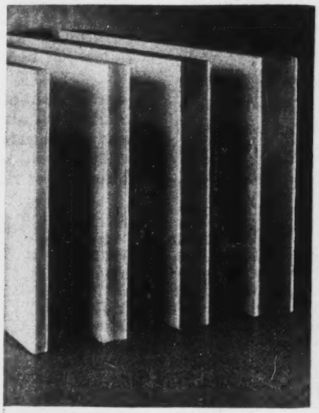
Table I—Cost of Concrete Panels Marietta, Ohio

(Based on 10 industrial buildings up to 100 ft high. Nominal panel size—8x8 ft by 5 in. thick)

	Cents per sq ft
Steel forms	6
Insulation	15 to 21
Wire mesh	6
Muslin for finish	5
Expanded metal ties	6
Inserts	2.7
Lifting U bars	1
Concrete (4,000 psi)	14
Tie wires, slab bolsters, corks	1
Lead sheets	1
Angle clips and iron clamps	6
Bolts	0.7
Joint sealing strip	1.3
Mastic, adhesives, motar	0.5
Metal reglet	0.3
Calking joints, incl. oakum.	9 to 12
Shop labor	40
Plant utilities	10
Transportation (6 miles)*	9
Erection	38 to 55
Shop drawings	5 to 10
Part total	178 to 209
Gen'l conditions, overhead and profit—20%	35 to 41
Total	213 to 250

* Panels were also shipped by truck 240 miles; cost 20 to 25¢ per sq ft.

Asbestos-cement panels



Johns-Manville photo

Johns-Manville, New York, N. Y., manufactures an impregnated insulating board faced on two sides with asbestos-cement boards. Installed by bolting or welding, panels are 4 x 8 ft by $\frac{11}{16}$ in., $1\frac{1}{8}$ in., $1\frac{9}{16}$ in. or 2 in. thick. The $1\frac{9}{16}$-in. panel, with an insulating core $1\frac{5}{16}$ in. thick, has a U of 0.21. It costs \$0.327 per sq ft, fob North Billerica, Mass.

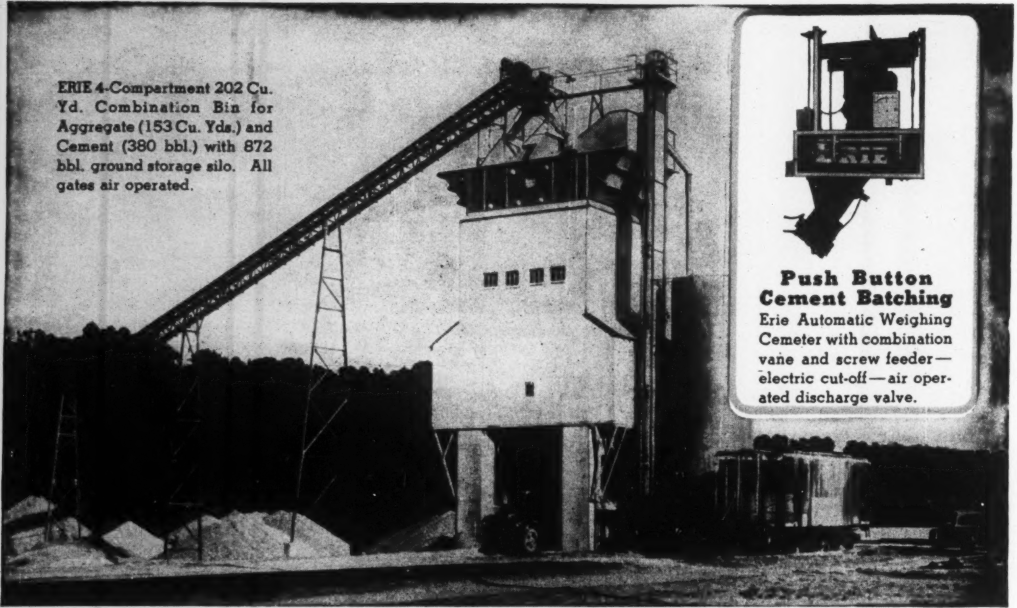
Erection costs for these panels are not available.

The Celotex Corp., Chicago, Ill., produces Cemesto panel – asbestos-cement facings and a core of laminated cane-fiber insulating board. The panels are 4 ft wide and from 4 to 12 ft long. Thicknesses are $1\frac{1}{8}$ in., $1\frac{9}{16}$ in. (U value, 0.19) and 2 in. (U value, 0.15).

A wall made of $1\frac{9}{16}$-in. Cemesto panels in New York City (held in place with steel H sections on steel framing) would cost \$0.732 per sq ft, exclusive of contractor's markup. This assumes truckload shipments and labor at \$3 per hour. A breakdown of this figure would show that the 4x8-ft panels cost \$0.327, fob Metuchen, N. J.; edge sealing, \$0.015; freight, \$0.015; H sections, \$0.10; calking H sections, \$0.04; fasteners, \$0.045; 26-ga Z flashings, 0.015; and erection labor, \$0.18.

Similarly, $1\frac{1}{8}$-in. panels, held in place with aluminum battens on steel framing, would cost \$0.273, fob Metuchen; edge sealing, \$0.015; freight, \$0.015; fasteners, \$0.045; 26-ga Z flashings, \$0.015; felt calking tape, \$0.005; aluminum battens, \$0.18; and erection, \$0.20. Total is \$0.748 per sq ft.

(Continued on page 147)



ERIE 4-Compartment 202 Cu. Yd. Combination Bin for Aggregate (153 Cu. Yds.) and Cement (380 bbl.) with 872 bbl. ground storage silo. All gates air operated.

Push Button Cement Batching

Erie Automatic Weighing Cemeter with combination vane and screw feeder—electric cut-off—air operated discharge valve.

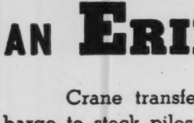
AN ERIE *High Speed* CENTRAL MIXING PLANT

Crane transfers sand and stone from river barge to stock piles. Tunnel belt conveyor under stock piles is loaded by push button air operated gates. A control panel, located on the ground near the junction of the tunnel and inclined belt conveyors, flashes the high and low bin signal lights to guide operator in directing proper material from stock piles. The material level in the 4-Compartments is automatically maintained within a set high-low range.

BATCHING OF CEMENT AND AGGREGATE IS FAST AND ACCURATE

ERIE 2 Cu. Yd. AggreMeter with hand controlled air operated charging and discharge gates—3 Beam Scale with over and under dial.

ERIE Cemeter with 2 Beam Scale and electric cut-off weighs cement automatically—hand controlled air operated discharge valve. Cement and aggregate is discharged into 2 -2 Cu. Yd. Mixers with a yield of 100 to 125 Cu. Yds. of concrete per hour under rigid inspection.



DIG MORE *and* FASTER

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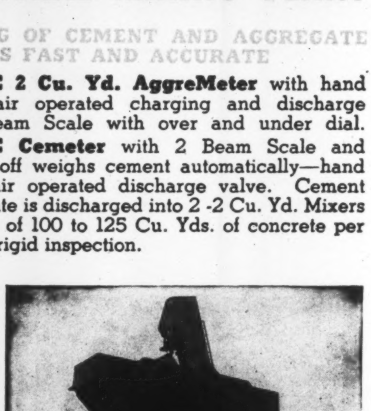

ERIE

STEEL CONSTRUCTION COMPANY

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Concrete-faced panels

Philip M. Grennan, of Ford, Bacon & Davis, New York City, has compiled a fairly complete set of cost data for concrete-panel construction. It is based on his experience with more than a half million square feet of wall construction for Electro Metallurgical Co., a division of Union Carbide and Carbon Corp., at Marietta, Ohio (ENR Jan. 24, p 34).

The panels are 8x8 ft or 8x10 ft by 5 in. thick. They consist of a 1½-in. core of Fiberglas, Durisol, Porex or Foamglas, sandwiched between two 1¾ in. layers of reinforced concrete. The U factor varies from 0.14 to 0.33, depending on the insulation used. Panels were fabricated by the Cemenstone Corp., Pittsburgh, Pa., and the Marietta Concrete Corp., Marietta, Ohio.

Mr. Grennan estimates that the panels cost from $2.13 to $2.50 per sq ft in place. His breakdown is given in Table I, p. 145.

Charles E. Annett, project engineer, Ebasco Services Inc., also is compiling cost data on panels. His figures are for a pulp mill now under construction for Irving Pulp and Paper Ltd, Fairville, New Brunswick, Canada. The panels were fabricated by Creaghan & Archibald Ltd of Montreal, Canada.

A total of 600 panels is required. They vary from 10 to 14 ft in width and 5 to 8 ft in height, but all are 6 in. thick. To meet functional requirements, 80 different sizes of panels are being used. The greatest number of one size made is 250 of the 6x10-ft panels.

Panels consist of 2 in. of Foamglas sandwiched between two 2-in. layers of 5,000-psi reinforced concrete. The outer face is decorated with a raised strip 7 in. wide and 1½ in. thick around openings for sash. Pitch is used as a vapor seal in the joints between insulation blocks and on one surface of the inside concrete facing. The U value of the wall is 0.164.

With about 30% of the panels erected, Mr. Annett estimates that they cost $2.15 per sq ft delivered to the site. This price includes special panels with sash, raised detail around the sash, and corner pieces.

The owner built the fabricating plant, which is about ¾ mile from the site. For use of the structure, the slab contractor is refunding $0.15 per sq ft.

Panels are being erected for $0.34½ per sq ft for labor and direct overhead, but not including general overhead and profit. The erection crew consists of four laborers at $1.00 per hour, two masons at $1.75 per hour, one rigger, one foreman, one truck driver and a crane operator.

Creaghan & Archibald also fabricated sandwich panels of similar cross section for the Ontario Hydro-Electric Power Commission in 1948 and 1949. Average size of these panels, though, was 13x16½ ft.

Cost quoted was $2.00 per sq ft at the plant. Transportation up to 20 miles added 5¢ to the cost; for any greater distance a casting plant is set up at the site. Erection cost varied from $0.20 to $0.45 per sq ft, depending on handling difficulties involved. It averaged under $0.30.

The same contractor also fabricated the panels for the pulp mill completed last year for Columbia Cellulose Ltd, a subsidiary of Celanese Corporation of America, on Watson Island, near Prince Rupert, British Columbia. Panels are 6x10 ft by 5½ in. thick. They consist of 2 in. of Foamglas sandwiched between two layers of reinforced concrete—one 1½ in. thick, the other 2 in. thick.

S. B. Roberts, chief engineer of Celanese, reported (ENR Feb. 22, '51, p 32) that the total cost of the panels was $2.10 per sq ft. His breakdown of erection costs is given in Table II.

Table II—Erection Costs*
Watson Island, B. C.

	Cents per sq ft
Labor, equipment rental	17.2
Moving panels and equipment	4.2
Breakage	1.8
Storage racks	1.5
Pointing, finishing joint labor	
Interior	1.9
Exterior	3.8
Jointing material	5.4
Clamps, bolts, lead sheets	3.7
Total	39.5

* In Canadian currency, 1950. Panels cost $1.70 per sq ft delivered.

Bearing walls also can be constructed of concrete sandwich panels. About 5,000 such units are being erected on a large project in the Midwest consisting of one and two-story houses. The units are about 8 ft high, 20 ft long and 8 in. thick. They consist of 1½ in. of Foamglas sandwiched between two layers of reinforced concrete—the outer facing is 2½ in. thick, the inner 4 in. U value is 0.22.

These panels cost about $1.85 per sq ft in place, ready for painting. Of this, $1.40 is the cost of fabrication and $0.45 covers the cost of erection.

- **How to cut costs more**—Analysis of the principal factors entering into the cost of sandwich panels indicates that there is a great potential for lower costs. Engineers are learning to design panels for less expensive fabrication and erection with no sacrifice in quality of the panels. Contractors meanwhile are gaining experience in erecting them, and soon can figure jobs much more closely than now. And more material producers are entering the market, encouraging the belief that increasing competition will bring prices down.

Also thought-provoking is the possibility of lowering costs through standardization. Engineers who have had experience with this type of construction strongly emphasize the savings they achieved by cutting down the number of different size panels on the job. And the economy is even greater when a manufacturer's mass-produced standard-type panels can be used throughout.

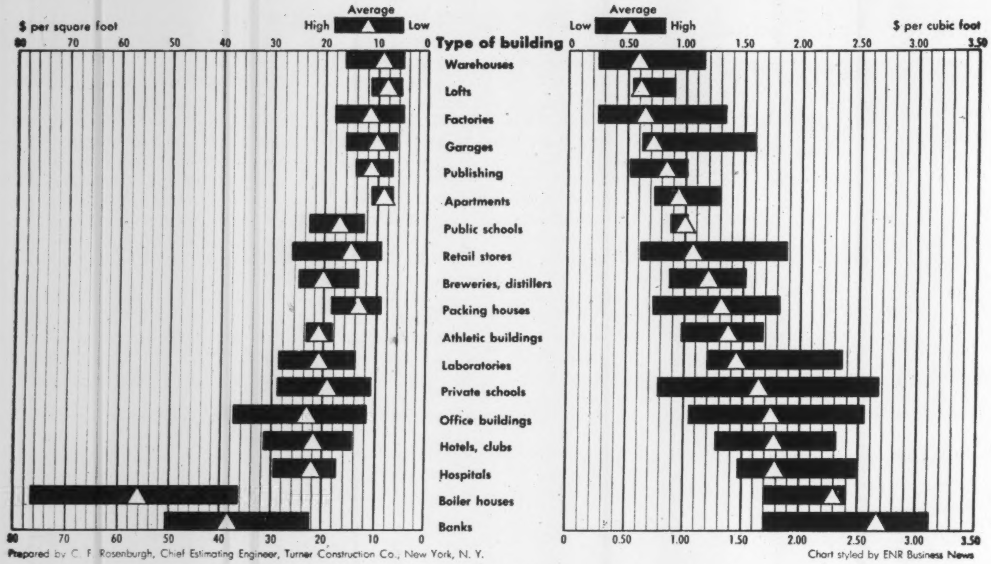
Caltech scientists study effects of big blast

Stresses created by the blast of 373,000 lb of explosive (Nitramon) on a building 500 yd. distant were the same as if the building had been pushed horizontally by a force equivalent to one-tenth of its weight.

Scientists of the Caltech Seismological Laboratory had special instruments set up for the blast at a Corona, Calif., quarry July 26, to measure the speed of the blast waves through the earth.

The results will be used to analyze the effects of large quakes on complicated structures as part of a continuing program of study to obtain more precise knowledge of how strong a building must be to withstand severe earthquakes.

The studies have not yet been completed.



Prepared by C. F. Rosenburgh, Chief Estimating Engineer, Turner Construction Co., New York, N. Y.

Chart styled by ENR Business News

UNIT COSTS OF BUILDINGS built by Turner Construction Company adjusted to April, 1952, also effective July, 1952

High, low and average building costs

What you have to pay for a new building is answered here according to the purpose for which it is to be used, or the type of building you want.

The Turner chart and table are part of the fiftieth anniversary celebration by that distinguished builder. They cover 300 buildings, adjusted by the Turner building cost index to April, 1952 costs. The same values apply to July, 1952. The value of the Turner index, on its new 1939 = 100 base is 270 for both dates. (In this costs issue of ENR, the Turner index is converted to a 1913 base to keep it comparable with other indexes shown.)

In these cost ranges the details as to mechanical equipment included could not be shown, but account for higher costs where mechanical and electrical installations are more elaborate and extensive.

Recent costs of individual buildings, showing type of construction and the amount of mechanical and electrical work have been supplied for this issue by six contractors across the country. These are shown in the tables on this and the following page.

The high, low, average costs reported by Fred Wright Construction Company, Nashville, Tenn. are an analysis of all the bids received. The single sq ft and cu ft costs reported under "average" are actual final costs of completed contract.

In addition to the standard types of construction, the George W. Carter Company, Los Angeles, Calif. reports on buildings having precast concrete panels. These are shown in the tables on the next page.

Building costs adjusted to April, 1952 cost index

300 buildings built by Turner Construction Company, New York

Type—in order of aver cost per sq ft		per sq ft low	aver	high	Type—in order of aver cube cost		per cu ft low	aver	high
1	Lofts	$5.70	$8.25	$11.75	1	Warehouses	$0.23	$0.58	$1.15
2	Apartments	7.20	8.90	11.20	2	Lofts	0.54	0.60	0.90
3	Warehouses	5.30	9.00	16.50	3	Factories	0.24	0.63	1.33
4	Garages	6.25	10.20	16.10	4	Garages	0.62	0.71	1.58
5	Factories	4.90	11.60	18.10	5	Publishing	0.52	0.83	1.01
6	Publishing	7.10	11.60	14.10	6	Apartments	0.73	0.93	1.29
7	Packing houses	9.10	13.90	18.80	7	Public schools	0.88	0.99	1.02
8	Retail stores	9.30	15.00	26.50	8	Retail stores	0.62	1.07	1.88
9	Public schools	12.25	17.50	23.25	9	Brewrs & distilrs	0.87	1.20	1.52
10	Private schools	10.75	19.25	28.75	10	Packing houses	0.73	1.31	1.82
11	Brewrs & distilrs	13.70	20.60	25.30	11	Athletic buildings	0.98	1.37	1.68
12	Laboratories	14.00	21.00	28.80	12	Laboratories	1.20	1.44	2.36
13	Athletic buildings	18.50	21.25	23.50	13	Private schools	.78	1.63	2.67
14	Hotels & clubs	14.50	22.00	31.50	14	Office buildings	1.05	1.75	2.55
15	Hospitals	17.50	22.25	29.50	15	Hotels & clubs	1.28	1.78	2.32
16	Office buildings	11.90	23.25	37.50	16	Hospitals	1.48	1.80	2.50
17	Banks	22.50	38.25	50.42	17	Boiler houses	1.72	2.30	2.40
18	Boiler houses	36.50	56.11	76.71	18	Banks	1.70	2.67	3.12

Building costs in Tennessee, 1949-51

Fred Wright Construction Co., Nashville

NASHVILLE, TENN. Type	Mech wk incl	Type	Date const	all bids submitted, dollars per sq ft high	aver	low	per cu ft high	aver	low
Storage warehouse	p-e-s	b-c-f	3/51	$5.85	$5.30	$4.80	$0.30	$0.27	$0.24
Newspaper printing	p-h-e-el-v	b-c-f	11/49	12.10	11.20	10.43	0.87	0.81	0.75
Church educational	p-h-e	b-c-f	5/51	13.75	12.80	12.40	0.89	0.85	0.80
College class rm	p-h-e-v-a	b-c	10/51	18.10	17.60	17.15	1.20	1.16	1.13
College dorm & din'g	p-h-e-el-v-r	b-c-f(2)	9/51	14.60	14.50	14.35	1.28	1.27	1.25
Bank add'n	p-h-e-v-a	b-c-f	12/51	.....	38.00[1]	.....	.....	1.63[1]	.....
Elem school	p-h-e	b-c	10/51	13.90	11.90	11.80	1.01	0.87	0.86
Stores, groc, drug, hdwr group	p-e	b-s	2/51	.....	7.06[1]	.....	.....	0.39[1]	.....
MADISON, TENN.									
High school	p-h-e-v	b-c	7/51	10.95	10.40	10.00	0.72	0.69	0.66

MECHANICAL: p-plumbing h-heating e-electrical s-sprinkler el-elevator v-ventilating r-refrigeration a-air-conditioning TYPE: c-concrete b-brick s-steel f-fireproof [1] actual costs

Building costs, N. Y., '50-'52

The John W. Cowper Company, Inc.,
Buffalo, N. Y.

TOWN Type	Mech wk incl	Type const	Date	Cost per sq ft	Cost per cu ft
School	p-h-e	b-c-s	4/52	$15.30	$0.963
School	p-h-e	b-c-s	6/52	14.70	0.862
Dormitories	p-h-e	m-c-s	10/50	.....	1.610
Hospital	none	b-c	11/50	11.85	1.090
CITY					
Office	none	b-c	6/52	$12.21	$0.869
Low cost hous'g					
2 & 3 story	p-h-e	fr-m-c	7/51, 3/52	.....	0.997[2]
multi-story	p-h-e	b-c	9/50	9.21[3]	1.036[3]
Hospital	none	b-c-s	7/50	.....	1.110
Fire house	none	b-s	1/51	.....	0.778
Church	p-h-e	m-s	12/50	16.62	0.791
Factory	compl	m-s	2/51	8.60	0.3967

MECHANICAL: p-plumbing h-heating e-electrical
TYPE: b-brick c-concrete s-steel m-masonry fr-frame [2] aver of 2 jobs, high $1.014, low $0.98 per cu ft [3] 7 bldgs

Building costs, Calif. '51-52

Means and Ulrich, Santa Ana

SANTA ANA, CALIF. Type	Mech. wk incl	Type const	Date	Cost/sq ft high	aver	low
Hospital, 2 bldgs	p-h-e-v-a	c-s	7/52	.....	$20.60	.....
Schools, elem, low cst*	p-h-e	fr-st	9/51	$10.10	8.40	$7.60
Mausoleum	p-e	c-s	7/52	.....	14.80	....
Warehouses, 3	none	fr	2/52	5.20	4.10	2.80
Residnce, custom, 5	p-h-e	fr	2/52	11.80	10.00	8.05
Office bldg, 3	p-h-e	fr	7/52	8.40	7.30	6.70

MECHANICAL: p-plumbing h-heating e-electrical v-ventilating a-air-conditioning TYPE: c-concrete s-steel fr-frame st-stucco * 15 bldgs, 4 sites

Building costs, Calif. 1952

George W. Carter Company, Los Angeles

LOS ANGELES Type	Mech wk incl	Type const	Date	Cost per sq ft
Whse, office	p-e-v-s	prc-w	4/52	$4.50
Office	p-e-a	s	4/52	11.00
Office	p-h-e-a	b-w	3/52	12.75
Warehouse	p	prc-f-s	6/52	5.43
Office	p-e-a	w-st	2/52	11.50
BURBANK				
Office	p-h-e-a-s	prc-f	3/52	8.20
Office	p-e-a-s	prc-c-s-w	3/52	6.30
MONTROSE				
Bank	p-e	b-c-w	6/52	10.35
VERNON				
Whse, office	p-e-v-a-s-pt	prc-w	6/52	5.55
LONG BEACH				
Market	p-e	prc-w	3/52	4.40

MECHANICAL: p-plumbing h-heating e-electrical s-sprinkler v-ventilating a-air-conditioning pt-part air-cond TYPE: b-brick c-concrete prc-precast concrete s-steel w-wood f-fireproof st-stucco

Building costs, Okla. 1952

Basandra Construction Co., Oklahoma City

STILLWATER, OKLA Type	Mech wk incl	Type const	Date	Cost per sq ft	Cost per cu ft
Off & Whse, R El Coop	p-h-e-a	b-c	1952	$12.50	$1.00

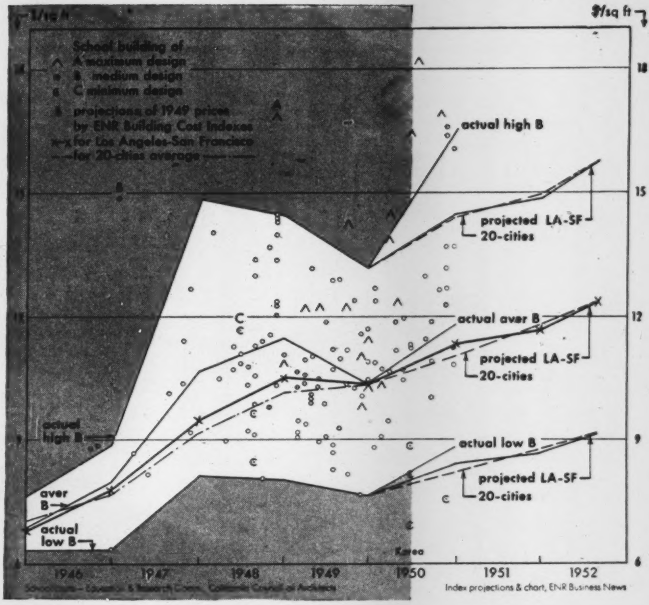
MECHANICAL: p-plumbing h-heating e-electrical a-air-conditioning TYPE: b-brick c-concrete

Building costs, Pa. 1952

Sessinghaus & Ostergaard, Erie

ERIE, PA. Type	Mech wk incl	Type const	Date	Cost per cu ft
School	none	f	1952	$0.93
Library	none	b-c-s-w	1952	0.80

TYPE: b-brick c-concrete s-steel w-wood f-fireproof



Index projections & chart, ENR Business News

School building costs in California, 1945-50

Education & Research Committee, California Council of Architects, Los Angeles

By years, dollars per square foot

	A Maximum design				B Medium design				C Minimum design			
	No	High	Aver	Low	No	High	Aver	Low	No	High	Aver	Low
1945	..	......	......	......	3	$7.65	$6.83	$6.27	..	......	......	......
46	..	......	......	......	3	8.84	7.98	6.32	..	......	......	......
47	..	......	......	......	8	14.85	10.68	8.12	..	......	......	......
48	2	$16.88	$13.94	$11.00	32	14.43	11.47	8.02	3	$11.65	$9.92	$8.48
49	7	14.28	11.92	9.90	42	13.14	10.31	7.65	..	......	......	......
50	7	18.24	14.67	10.48	32	16.51	11.81	8.80	4	8.83	7.85	6.90

These prices exclude: utility installations, special water systems or excessive sewer lines; on site fencing, excessive grading, paving, sprinkling systems; off-site streets, curbs, gutters, street sidewalks; architects and other fees; land acquisition.

They cover 143 schools of which 120 are medium design, 16 maximum and 7 minimum.

Contract prices for 1951 and 1952 are not available. Projecting 1949 or 1950 bid prices as noted below by means of the ENR Building Cost Indexes gives these results:

Price ranges for 1951-52—estimated by cost index projections

dollars per square foot

	A Max des			B Med des			C Min des		
	high	aver	low	high	aver	low	high	aver	low
1949	$14.28	$11.92	$9.90	$13.14	$10.31	$7.65	......	......	......
1950 actual	18.24	14.67	10.48	16.51	11.81	8.80	$8.83	$7.85	$6.90
1949 projected by ENR building cost index 1950 LA-SF	15.70	13.11	10.89	14.45	11.34	8.42	......	......	......
20-city	15.28	12.75	10.59	14.06	11.04	8.20	......	......	......
							1950 proj by index		
1951 LA-SF	16.14	13.47	11.19	14.85	11.65	8.64	9.11	8.10	7.12
20-city	16.28	13.59	11.29	14.98	11.75	8.72	9.42	8.38	7.36
Aug '52 LA-SF	17.14	14.30	11.88	15.77	12.37	9.18	9.45	8.40	7.38
20-city	17.14	14.30	11.88	15.77	12.37	9.18	9.98	8.87	7.80

For this study of school costs, 34 architects supplied data to the Education and Research Committee, California Council of Architects, Los Angeles.

Differences between A-maximum, B-medium and C-minimum construction are set forth in extensive detail. But briefly these include: A and B classrooms are 900-1,000 sf in size, C classrooms are 650-960 sf. A schools are 1- or 2-story, usually 2, B and C are 1. A buildings are fire-resistive, reinforced concrete, brick and steel, B have steel roof and wall framing, some wood, some masonry or concrete wall construction, C schools are least fire resistive.

A and B schools have horizontal or vertical fixed louvres for daylight control, C no fixed louvres, sometimes venetian blinds.

Similarly A and B schools have more refinements in heating, lighting and plumbing.

NOTE: For 1952 school costs in New York City, see ENR, June 19, 1952, page 134. These continue the series of school costs reported in ENR, March 29, 1951, page 165.

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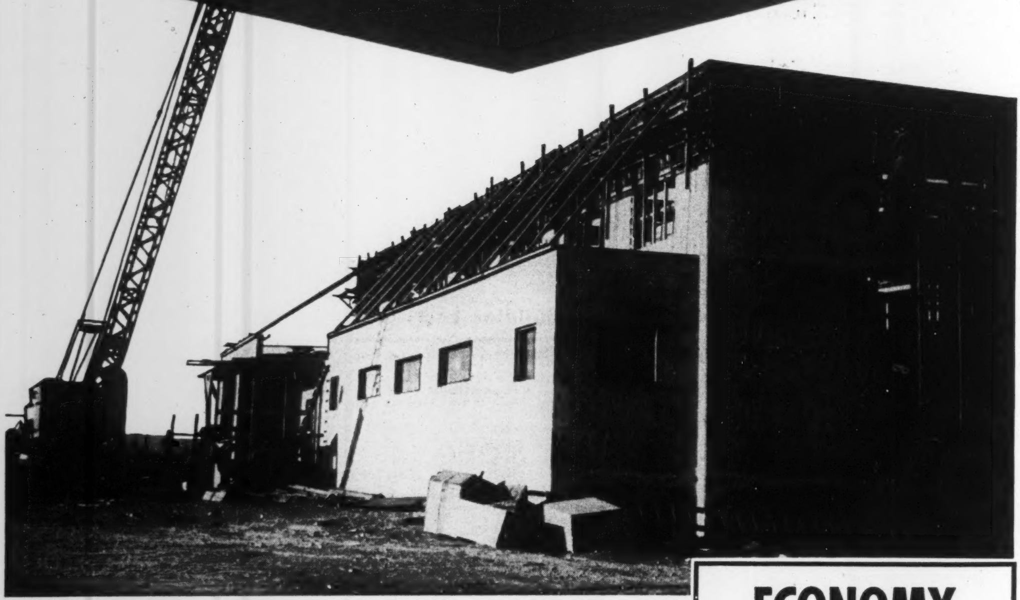

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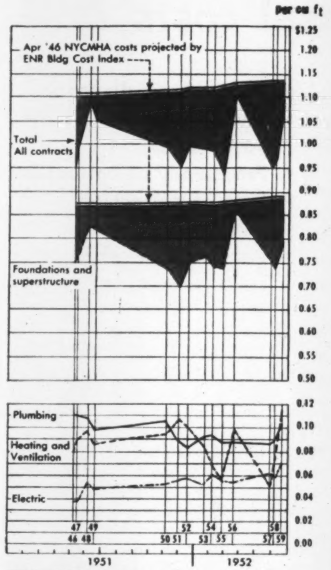


NYC Housing Authority Data

Contract totals and unit prices on public housing

1951 awards by New York City Housing Authority

Project Number	(46)	(47)	(48)	(49)	(50)	(51)	(52)
Project	**St. Nicholas II**	**Throgg's Neck**	**Redfern**	**Edenwald**	**Bronxdale**	**Gravesend**	**Cooper Park**
Total constr. rooms.........No.	1,811	4,844	1,416	8,673	6,257	2,634	2,933
Total apartments..........No.	439	1,185	360	2,039	1,497	634	700
Rooms per apt.,......aver. No.	4.13	4.09	3.93	4.25	4.18	4.15	4.19
Total cubage............cu. ft.	3,822,770	11,440,850	3,265,906	17,847,449	12,238,008	5,356,500	5,878,957
Bid date.....................	5/8/51	5/13/51	6/5/51	6/19/51	11/8/51	11/30/51	12/19/51
Cost per:							
Total contract...............	$3,641,860	$11,392,679	$3,537,649	$18,710,805	$12,158,706	$5,101,291	$5,831,355
Constr. room...............	2,010.96	2,351.91	2,498.34	2,157.36	1,943.22	1,936.71	1,988.19
Apartment................	8,295.81	9,614.07	9,826.80	9,176.46	8,122.05	8,046.20	8,330.51
Cu. ft.....................	0.952	0.995	1.083	1.048	0.995	0.952	0.992
Fndns. and superstruct........	2,849,650	8,675,515	2,693,800	14,591,369	9,083,114	3,756,207	4,416,831
Constr. room...............	1,573.52	1,790.98	1,902.40	1,682.39	1,451.67	1,426.05	1,505.91
Apartment................	6,491.23	7,321.11	7,482.78	7,156.14	6,067.54	5,924.62	6,309.76
Cu. ft.....................	0.746	0.758	0.825	0.817	0.743	0.701	0.751
Heating & ventilation..........	309,171	1,018,000	321,950	1,533,777	1,149,182	576,837	587,000
Constr. room...............	170.71	210.16	227.37	176.85	183.66	219.00	200.14
Apartment................	704.26	859.07	894.31	752.22	767.66	909.84	838.57
Cu. ft.....................	0.081	0.089	0.098	0.086	0.094	0.107	0.100
Electrical constr..............	147,350	435,000	171,899	856,000	646,990	298,800	341,278
Constr. room...............	81.36	89.80	121.40	98.69	103.40	113.44	116.36
Apartment................	335.64	367.09	477.50	419.81	432.19	471.29	487.54
Cu. ft.....................	0.038	0.038	0.053	0.048	0.053	0.056	0.058
Plumbing....................	335,689	1,264,164	350,000	1,729,659	1,279,420	469,447	486,248
Constr. room...............	185.36	260.97	247.18	199.43	204.48	178.23	165.79
Apartment................	764.66	1,066.81	972.22	848.20	854.66	740.45	694.64
Cu. ft.....................	0.087	0.110	0.107	0.097	0.105	0.088	0.083
Piling or abnorm. fndns........	32,000	1,500,000	158,000	300,000	871,500	350,000	-0-

1952 awards

Project number	(53)	(54)	(55)	(56)	(57)	(58)	(59)
Project	**Van Dyke I**	**Baruch I**	**Geo. Washington I**	**Redfern II**	**Stephen Foster II**	**Highbridge**	**Mariners Harbor**
Total constr. rooms.........No.	3,662	3,105	2,608	478	2,823	2,933	2,553
Total apartments..........No.	884	738	637	96	712	700	607
Rooms per apt.,......aver. No.	4.14	4.21	4.09	4.98	3.96	4.19	4.21
Total cubage............cu. ft.	7,665,199	6,170,000	5,650,000	951,897	5,770,000	5,837,785	5,691,790
Bid date.....................	1/18/52	2/8/52	2/26/52	3/18/52	5/27/52	6/4/52	6/18/52
Cost per:							
Total contract...............	$7,567,189	$5,974,010	$5,317,096	$1,045,017	$5,491,871	$5,684,694	$6,123,865
Constr. room...............	2,066.40	1,923.99	2,038.76	2,186.23	1,945.40	1,938.18	2,398.69
Apartment................	8,560.17	8,094.86	8,347.08	10,885.59	7,713.30	8,120.99	10,088.74
Cu. ft.....................	0.987	0.968	0.941	1.097	0.952	0.973	1.076
Fndns. and superstruct........	5,807,010	4,602,145	4,183,560	815,537	4,337,506	4,357,172	4,486,965
Constr. room...............	1,585.75	1,482.17	1,604.12	1,706.14	1,536.49	1,485.57	1,757.53
Apartment................	6,569.02	6,235.96	6,567.59	8,495.17	6,092.00	6,224.53	7,392.03
Cu. ft.....................	0.758	0.745	0.740	0.856	0.751	0.746	0.788
Heating & ventilation..........	646,700	423,860	321,220	93,250	305,733	465,000	662,000
Constr. room...............	176.59	136.50	123.16	195.08	108.30	158.54	259.30
Apartment................	731.56	574.33	504.27	971.35	429.40	664.43	1,090.61
Cu. ft.....................	0.084	0.068	0.057	0.098	0.053	0.079	0.116
Electrical constr..............	420,000	376,970	317,980	52,290	354,400	347,967	398,900
Constr. room...............	114.69	121.40	121.92	109.39	125.54	118.64	156.25
Apartment................	475.12	510.79	499.18	544.68	497.75	497.09	657.17
Cu. ft.....................	0.054	0.061	0.056	0.055	0.061	0.059	0.070
Plumbing....................	693,479	571,035	494,336	83,940	494,230	514,555	576,000
Constr. room...............	189.37	183.90	189.54	175.60	175.06	175.44	225.62
Apartment................	784.48	773.76	776.03	874.37	694.14	735.08	948.93
Cu. ft.....................	0.091	0.092	0.087	0.088	0.086	0.088	0.101
Piling or abnorm. fndns........	45,000	436,000	475,000	57,000	300,000	200,000	335,000

Project costs are based on foundations, superstructures, (or general construction) including elevators, heating and ventilating, electric work and plumbing. Contract costs shown do not include architects fees, inspection, piling or abnormal foundations, relocation of existing buildings, refrigerators, gas ranges, site improvements, or park developments.

Public housing costs in New York City

All public housing built by New York City Housing Authority in 1951-52 as reported here, is low rent, fully subsidized. All is of reinforced concrete construction with brick exterior walls and tile backup block. The number and size of buildings and the number of families housed by each project are shown in the accompanying tables which show also the cube costs.

In 1952 these contract prices per cubic foot range from $0.941 to $1.097. This compares with the 1951 range of $0.952 to $1.083. Bids taken since these tables were made up, for which details are not available, indicate that they will be lower than the '52 prices shown here. This is due, the Authority says, to keen competition because of fewer new jobs in the Metropolitan area under present government restrictions.

All prices during the year were lower in relation to April, 1946 prices than the trend in the cost of wages and materials as measured by the ENR Building Cost index. Price tends back to April, 1946 are shown on a chart in ENR March 29, 1951, page 167. The chart above is a continuation of the earlier record.

The two Redfern projects show higher than average unit prices. Two reasons are given, one is that they are located in the Rockaways on Long Island, and the other is that they are smaller projects. Redfern I has five 6-story buildings, Redfern II has only two.

Mariners Harbor, too, shows higher than average costs due to the fact that it is on Staten Island, also to the fact that it has 10 3-story buildings.

Projects farthest away from the center of the City tend to have higher costs, and the lower buildings produce higher unit costs than do the higher buildings.

The latter explanation applies to Edenwald houses which show a cube cost of $1.048 and have 28 3-story buildings in addition to its 14 12-story buildings.

The trend in New York City Housing Authority structures is toward fewer and higher buildings to take advantage of the lower unit prices they produce.

Characteristics of 1951-52 New York City public housing

Project		No. of buildings	Height stories	No. of elevators
1951				
St. Nicholas II..............	**FP**	4	14	8
Throggs Neck..............	**FC**	12	7	24
		17	3	—
Redfern, I..................	**SP**	5	6	10
Edenwald..................	**FC**	14	12	24
		28	3	—
Bronxdale..................	**FC**	28	7	28
Gravesend..................	**FC**	15	7	15
Cooper Park..............	**FC**	11	7	13
1952				
Van Dyke, I................	**FP**	7	14	14
		6	3	—
Baruch, I..................	**FP**	5	14	10
		1	7	2
George Washington, I.......	**FP**	5	14	10
		1	12	2
		1	2	—
Redfern, II................	**SP**	2	6	2
Stephen Foster, II.........	**SP**	3	14	6
		2	13	4
Highbridge................	**FC**	4	13	8
		2	14	4
Mariners Harbor...........	**FC**	12	6	12
		10	3	—

***F Federal aid *S State aid *C Cost of complete boiler plant included in heating & ventilating and in total costs *P Proportionate part of boiler plant so included**

How to compare refuse disposal costs

This information is the basis:

. . . Quantities of refuse

Kinds of Refuse Materials	Average Cu yd per cap per year	Average Lb per cap per year	Maximum month Lb per cap per year	Maximum week Lb per cap per year
Garbage	0.35	280	350	400
Combustible rubbish	1.35	305	365	400
Noncombustible rubbish	0.50	125	180	200
Ashes	0.70	805	1,210	1,325
Rubbish and ashes	2.55	1,235	1,625	1,700
Garbage and combustible rubbish	1.70	585	715	800
Ashes and noncombustible rubbish	1.20	930	1,390	1,525
Mixed refuse	2.90	1,515	1,875	1,950

. . . Frequency of pick-ups

Class refuse	Type district	Number of pickups Per load	Number of pickups Per hour	Number of pickups Per man-hr	Quantity of refuse per pickup Lbs	Quantity of refuse per pickup Cu ft
Unwrapped garbage	Commercial and university buildings	66.0	31.3	10.4	132.0	3.45
Wrapped garbage	Residential—single family units	441.0*	103.6	34.5	14.3	——
Wrapped garbage	Residential—multiple family units	515.0	101.5	33.8	24.6	0.68
Rubbish & ashes	Residential—single family units	52.7	75.8	25.2	52.5	6.15
Rubbish & ashes	Residential—multiple family units	33.0	47.5	15.8	82.8	9.81

* Not a full load.

. . . Number of trucks

Project	Classes of refuse	Miles to disposal area	Trucks required No.	Trucks required Capacity Cu yd	Trucks required Type body*
1-A	Unwrapped garbage	3.0	3	8.5	E
	Garbage and combustible rubbish	3.5	19	12.0	E
	Ashes and noncombustible rubbish	3.0	8	6.0	O
1-B	Unwrapped garbage	2.5	3	8.5	E
	Garbage and combustible rubbish	2.7	19	12.0	E
	Ashes and noncombustible rubbish	3.0	8	6.0	O
2	Unwrapped garbage	2.5–20	3	8.5	E
	Mixed refuse	2.5	23	15.0	E
		5.0	25	15.0	E
		10.0	29	15.0	E
		15.0	33	15.0	E
		20.0	37	15.0	E
3-A	Unwrapped garbage (slops)	2.2	3	8.5	E
	Unwrapped garbage (res.)	2.9	12	12.0	E
	Rubbish and ashes	3.0	11	6.0	O
3-B	Unwrapped garbage (slops)	8.5	3	8.5	E
	Unwrapped garbage (res.)	9.0	13	12.0	E
	Rubbish and ashes	3.0	11	6.0	O

* E = Enclosed mechanical loading and compacting. O = Open dump.

- **Method of disposal**
- **Length of haul to disposal sites**
- **Frequency of collection**
- **Size of collection vehicles**
- **Location of pickups—curb or rear of building**

On these factors, the Chicago consulting firm of Greeley and Hansen has based a thorough cost study of comparative projects for Madison, Wis. In a report on this study, authors S. M. Clarke and M. D. R. Riddell (respectively partner and assistant engineer in the firm) present full fact-and-figure proof of why sanitary landfill is their answer for Madison. The cost estimates and basic thinking behind them are presented here as useful guides to the engineer with a refuse disposal cost problem.

• Madison's problem—All Madison's garbage is at present collected in closed trucks by city forces and delivered to a private hog farm north of the city; rubbish and ashes are collected by city forces in open trucks and disposed of in three open dumps. The hog farmer claims his income insufficient to justify improvements recommended by the State Department of Health for abating nuisances in his operation. And he has indicated he will not renew his contract with the city when it expires in June, 1953.

It was the consultant's problem to review existing methods, determine quantities and characteristics of refuse, study and compare alternate methods for disposal and recommend a suitable method.

In figuring population, the engineers took into consideration a large, ten-month student population in the city. And they subtracted the number of students attending school elsewhere. On this basis present population of Madison is estimated close to 100,000.

Design population chosen for the report is 125,000 in the city. For estimating operating cost an intermediate population of 110,000 has been used. Area within the city is 16 sq mi. Population density is 6,000 per sq mi.

Location of its downtown section on a neck of land between two lakes divides the city into two parts and creates a bottleneck for traffic between these parts. This and other factors favor use of more than a single disposal site; the other factors include undesirable long haul from one side of the city to the other.

It is estimated that the total number of collection points (buildings) in the city is now 18,915. This breaks down to 16,195 residential, 1,400 mercantile, 70 manufacturing and 1,250 tax-exempt properties. Excluding manufacturing establishments responsible for disposing of their own refuse, this means a potential maximum number of 18,845, or 197 per 1,000 population. Projected into the future, the estimate for 1960 is 21,670; for 1970, 24,600. Assuming a certain number of residences vacant at all times, both these totals are multiplied by 95% for an estimate of the actual number of collection points.

• **Nature of the product**—Cost of collection and, to some extent, cost of disposal are affected by unit weight of refuse. Madison has long-term records available which indicate average unit weights of 800 lb per cu yd for garbage, 225 for combustible rubbish, 250 for non-combustible rubbish, 1,150 for ashes, 500 for rubbish and ashes, 350 for garbage and combustible rubbish, 775 for ashes and non-combustible rubbish and 525 for mixed refuse.

Per capita garbage quantities may be expected to decrease somewhat in the future, due to increased use of packaged, frozen and concentrated foods. Garbage grinders will further reduce the quantities to be collected. Increased use of disposable containers has made an increase in rubbish. Increased use of gas and oil will reduce production of ashes, but increase the amount of combustible rubbish.

In 1951, there were 271 pounds of garbage per capita collected—lowest figure on record since 1936. Rubbish and ashes totalled 1.295 cu yd per capita in 1951.

• **Collection practice**—Present practice has the city divided into eight districts for garbage collection, each served by one truck. In addition, there are two "slop" trucks collecting from restaurants, hotels, groceries, etc. Collectors go to the rear of buildings with a 12-gal can in each hand, transfer the garbage to these cans, then bring full loads out to the street and the trucks. At present there are 15 trucks available —six are 13-cu yd, four are 12-cu yd. and five are 8½-cu yd. Trucks in residential areas make one load per day.

Each truck carries a crew of three men. All three work as loaders, and the fellow who falls behind moves the truck up ahead to catch the others. Relatively good working conditions

These are the estimated costs:

. . . Incineration costs (one incinerator)

Item	Estimated Cost City of Madison	Estimated Cost Madison Metropolitan Area
Operating Costs		
Labor:		
Foreman	$ 3,682.50	$ 3,682.50
Crane Operators (3)	10,627.50	10,627.50
Charging Floor (3)	9,301.50	9,301.50
Stoking Floor (3)	9,961.50	9,961.50
Storage Bin	3,320.50	3,320.50
Weighman	3,120.50	3,120.50
Spare	3,320.50	3,320.50
Ash Truck Drivers (3)	10,203.00	10,203.00
Subtotal	$53,537.50	$53,537.50
Utilities: Power, light, water, etc.	4,000.00	4,500.00
Ash Truck Operation	1,000.00	1,000.00
Supplies	1,000.00	1,000.00
Maintenance and Repair @ 1½% of Construction Cost	11,550.00	13,350.00
Total Operating Cost	$71,087.50	$73,387.50
Fixed Charges		
Ash Truck:		
$5,000 @ 20%	$ 1,000.00	$ 1,000.00
Incinerator:		
$770,000 @ 6.4%	49,280.00	
$890,000 @ 6.4%		56,960.00
Total Fixed Charges	$50,280.00	57,960.00
TOTAL ANNUAL COSTS	$121,367.50	$131,347.50

. . . Cost of dumping non-combustible

Item	Estimated Cost	
Capital Cost		
Bulldozer	$10,000.00	
Fencing	1,500.00	
Storage Sheds (3 @ $2,000)	6,000.00	
Miscellaneous Tools	750.00	
	$18,250.00	
Miscellaneous @ 10%	1,750.00	
Subtotal		$20,000
Land: 115 acres @ $500 per acre		57,500
Total Capital Costs		$77,500
Annual Costs		
Operating Costs:		
Equipment Operator	$3,342.50	
Laborers (3 @ $3,320.50)	9,961.50	
Fuel, supplies, equipment maintenance	5,000.00	
Total Operating Cost		$18,504
Fixed Charges:		
Equipment: $11,750 @ 20%	2,350.00	
Structures: $8,250 @ 6.4%	530.00	
Land: $57,500 @ 6.4%	3,680.00	
Total Fixed Charges		$ 6,560
Total Annual Cost		$25,064

These are more estimated costs . . .

. . . Incineration (two incinerators)

	Estimated Cost			
Item	**City of Madison**		**Madison Metropolitan Area**	
Operating Costs				
Labor:				
Foremen (2)	$7,365		$7,365	
Charging Floor (4)	12,402		12,402	
Stoking Floor (2)	6,641		6,641	
Ash Truck Drivers (2)	6,802		6,802	
Weighmen (2)	6,241		6,241	
Spares (2)	6,641		6,641	
Subtotal	$46,092		$46,092	
Utilities: Power, water, light, etc	$2,000		$2,250	
Ash Truck Operation	1,500		1,500	
Supplies	2,000		2,000	
Maintenance and Repair @ 1½% of Construction Cost	20,800		24,030	
Total Operating Cost		$72,392		$75,872
Fixed Charges				
Ash Trucks:				
$10,000 @ 20%	$2,000		$2,000	
Incinerators:				
$1,386,000 @ 6.4%	88,700			
$1,602,000 @ 6.4%			102,530	
Total Fixed Charges		90,700		104,530
TOTAL ANNUAL COSTS		$163,092		$180,402

. . . Annual cost of landfill

	Estimated Cost			
Item	**City of Madison**		**Madison Metropolitan Area**	
Operating Costs				
Equipment Operators (2)	$7,085		$7,085	
Laborers (4)	13,282		13,282	
Fuel, supplies, equipment maintenance	15,000		17,500	
Cover Material:				
19,200 cu. yd. @ $2.50/cu. yd.	48,000			
21,400 cu. yd. @ $2.50/cu. yd.			53,500	
Total Operating Costs		$83,367		$91,367
Fixed Charges				
Equipment: $81,000 @ 20%	$16,200		$16,200	
Structures: $10,500 @ 6.4%	672		672	
Land: $99,000 @ 6.4%	6,336			
$110,700 @ 6.4%			7,085	
Total Fixed Charges		23,208		23,957
TOTAL ANNUAL COSTS		$106,575		$115,324

. . . Comparative project costs

Project	Method of Disposal	First Cost	Total Annual Cost
1-A	Incineration—Single Plant	$951,500	$454,556
1-B	Incineration—Two Plants	1,554,500	486,760
2	Land Fill	364,500 to 582,000	379,972 to 616,259
3-A	Garbage Grinding to Sewers	1,686,500	495,922
3-B	Garbage Grinding at Sewage Treatment Plant	1,040,000	450,821

and pay bring high caliber personnel and prevent a large labor turnover. It is union labor.

Field studies have been carried out to determine the rate of work of collectors. Number of pickups, weight and volume of each load, time and mileage while collecting and going to the disposal area were all recorded. Average rate of travel was found to be 15 miles per hour.

• **Disposal practice**—Present rubbish dumps are in marshy land unsuitable for development. Combustible rubbish is burned at all dumps to reduce total volume. Bulldozers level the sites occasionally. There is some nuisance.

In a discussion of alternative disposal methods, the consultants call sanitary fill one of the most economical means of disposing of mixed refuse. Little nuisance results when the fill is properly operated. Incinerators, too, can be operated completely without nuisance, and ashes amounting to 10 to 20% by weight of refuse can be used as landfill. Hog feeding is not entirely satisfactory and is recommended against for the future. Disposal of ground garbage with sewage either through a grinding plant into the sewer or directly into sludge digestion tanks still does not eliminate the problem of ashes and rubbish, which constitute about 90% by volume of total refuse production. Disposal of garbage by reduction is called a vanishing method and is recommended against.

Composting is rejected on the grounds of "uncertain and apparently high" first and operating costs, increased collection costs by reason of separation required, and absence of operating data under U.S. conditions. (For description of the only full-scale commercial composting plant operating on municipal refuse in the U.S. see "Composting for profit," ENR June 26, p 44.)

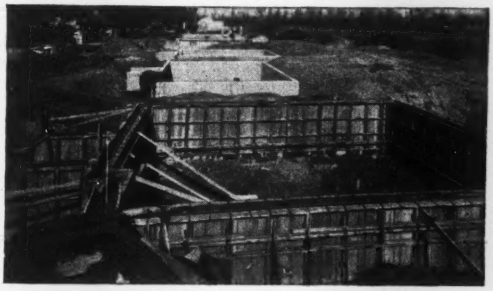
• **Alternates considered**—As a basis for comparative estimates, the consultants had first to define alternate projects.

Project 1-A—one incinerator—calls for disposal of all garbage and combustible rubbish in a single incinerating plant, ashes and non-combustible rubbish to be disposed of in controlled dumps. Collection of unwrapped garbage from restaurants, etc., would be in enclosed, mechanical-body, 8½-cu yd trucks. Collection of wrapped garbage and combustible rubbish would be in similar trucks with 12-cu yd capacity. Ashes and non-combustibles would be collected in open dump trucks with 6-cu yd level-full capacity.

(*Continued on p. 156*)

Symons FORMING SYSTEM

engineered to fit special needs...



Mass Production Made Easy with Symons System

Robert E. Judge, Concrete Contractor, Bellwood, Illinois

400 concrete foundations were expertly framed in record time with Symons Forms. "Weather and material permitting, these 25′ x 32′ foundations were set up in four hours by three men," stated the contractor. This rapid, economical means of form erection can be accomplished because panels are standarized and the erection hardware, which consists of three basic pieces, is easily secured.

Reinforced Forms for High Walls, Fast Pours

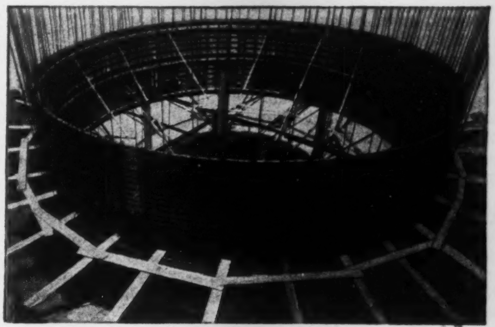
James Stewart, General Contractor, Chicago, Illinois

Pouring of these high walls with pressures from 650 to 1500 pounds per square foot required Symons ¾″ Plywood Forms with steel ribs every 12″. These heavy duty forms allowed the use of additional ties where the pressure was the greatest. Setting up and stripping was executed at the lowest possible cost due to the Symons System of securing forms and ties in one operation.

Setting Up Forms on a 16′ Battered Wall

James Leck, General Contractor, Minneapolis, Minnesota

Ties were placed in position when outside forms were erected. After erecting steel, inside forms were set in place and secured to the ties. Battered walls are handled similar to vertical walls, the only difference being the variance in the length of ties. Symons provides any special length ties promptly at little or no extra charge. Scaffolding was secured with standard hardware.



Setting Up Forms for Sewage Disposal Tank

G. L. Tarlton, General Contractor, St. Louis, Missouri

Steel rib panels with V shaped fillers at each joint were employed. The connecting bolts used in joining two panels and for anchoring ties pass through these fillers. Reinforcing is placed prior to locking of outside forms to panel ties. Symons Forming System is a simple method of forming that is adaptable to straight walls, battered walls, curved walls and slabs.

S Symons

SYMONS CLAMP and MFG. CO.

4265 Diversey Ave. Dept. I-2 Chicago 39, Illinois

Please send information on Symons Forms. (We will provide complete layout if plans are sent with request.)

Name______________________________

Address____________________________

City____________________Zone______State________

And this is a summary of annual costs:

			Distance to	Estimated Annual Costs								
			Disposal	Collection			Disposal			Collection and Disposal		
Project	Classes of Refuse	Method of Disposal	Area—Miles	Operation	Fixed Charges	Total	Operation	Fixed Charges	Total	Operation	Fixed Charges	Total
1-A	Garbage and Combustible Rubbish	Incineration (Single Plant)	3.5	$199,914	$38,060	$237,974	$71,088	$50,280	$121,368	$271,002	$88,340	$359,342
	Ashes and Nor combustible Rubbish	Controlled Dumping...	3.0	61,750	8,400	70,150	18,504	6,560	25,064	80,254	14,960	95,214
				$261,664	$46,460	$308,124	$89,592	$56,840	$146,432	$351,256	$103,000	$454,556
1-B	Garbage and Combustible Rubbish	Incineration (Two Plants)	2.7	$191,714	$36,740	$228,454	$72,392	$90,700	$163,092	$264,106	$127,440	$391,546
	Ashes and Noncombustible Rubbish	Controlled Dumping...	3.0	61,750	8,400	70,150	18,504	6,560	25,064	80,254	14,960	95,214
				$253,464	$45,140	$298,604	$90,896	$97,260	$188,156	$344,360	$142,400	$486,760
2	Mixed Refuse..........	Land Fill............	2.5	$224,172	$49,225	$273,397	$83,367	$23,208	$106,575	$307,539	$72,433	$279,972
			5.0	257,172	54,430	311,602	83,367	23,208	106,575	340,539	77,638	418,177
			10.0	314,884	63,390	378,274	83,367	23,208	106,575	398,251	86,598	484,849
			15.0	372,144	72,000	444,144	83,367	23,208	106,575	455,511	95,208	550,719
			20.0	429,084	80,600	509,684	83,367	23,208	106,575	512,451	103,808	616,259
3-A	Garbage...............	Grinding (To Sewers)..	2.9	$132,844	$24,670	$157,514	$48,742	$97,090	$145,832	$181,586	$121,760	$303,346
	Rubbish and Ashes::.....	Land Fill...........	3.0	94,500	11,230	105,730	68,226	18,620	86,846	162,726	29,850	192,576
				$227,344	$35,900	$253,244	$116,968	$115,710	$232,678	$344,312	$151,610	$495,922
3-B	Garbage:...............	Grinding (At Sewage Treatment Plant)	9.0	$145,224	$26,140	$171,364	$32,001	$54,880	$86,881	$177,225	$81,020	$258,245
	Rubbish and Ashes::.....	Land Fill...........	3.0	94,500	11,230	105,730	68,226	18,620	86,846	162,726	29,850	192,576
				$239,724	$37,370	$277,094	$100,227	$73,500	$173,727	$339,951	$110,870	$450,821

Project 1-B—two incinerators—is same as 1-A, except two incinerators of smaller capacity would be built.

Project 2—sanitary landfill—envisages collection of all refuse together (except for unwrapped garbage from large producers) and disposal in controlled sanitary landfills. Collection of unwrapped garbage would be in 8½-cu yd trucks as at present; collection of all other refuse would be in 15-cu yd trucks.

Project 3-A—All garbage would be collected unwrapped and ground at two grinding stations along the line of sewage flow. Rubbish and ashes would be disposed of separately as fill in dumps.

Project 3B—Would use a single grinding stations located at the sewage treatment works so that ground garbage could be discharged directly into sludge digestion tanks. No addition to secondary treatment facilities would be required, only sludge disposal facilities would have to be expanded.

• **Basis of cost estimate**—All estimates of annual cost apply to the year 1960, representing an average annual cost for the period from 1952 to 1970.

First cost of collection equipment and of additional garage space to house it is estimated for each alternate project. Annual collection costs are estimated at 20¢ per mile for enclosed, mechanically loading trucks and 12¢ per mile for open dump trucks. This includes gas, oil, tires, licenses, insurance, maintenance and repair. Added to this are labor costs plus fixed charges covering interest and amortization computed at 20%, based on a useful life of 5 years. Fixed charges on garage space have been computed at 6.4%, based on useful life of 20 years and a 2½% interest rate.

In estimating first cost of disposal in landfills, capacity for 20 years at an assumed price of $500 per acre is figured.

Assuming rates of work as figured, and frequency of collection, size of collection vehicles, and other factors as described, the total number of trucks required for 1960 operation is calculated. From this, the total annual cost of collection, including fixed charges on equipment and garage space are estimated.

Cost of disposal by incinerators is figured on the capacity needed during the maximum week of the year 1970. This is 192.5 tons per day for a five-day week, or 222.5 tons per day including the entire metropolitan area. A 24-hour operation would be desirable, so estimates are on basis of a crane-and-bin plant. Recent construction costs indicate such a plant can be built for about $4,000 per ton per 24-hr rated capacity. First cost for a plant to serve the city would therefore be $770,000. Annual cost would be $121,367. An area of 5.75 acres per year will be required for disposal of ashes and non-combustibles. Annual cost of operating these dumps are figured to be $25,064.

Project 1-B is based on two plants of about 11-ton per hour capacity, not required to operate around the clock. Recent construction costs indicate a unit price of about $3,000 per ton per 24-hr rated capacity for this type installation. The cost of the two incinerators to serve the city would be $1,386,000. Annual operating cost would be about $163,000; dumping would cost about the same as for Project 1-A.

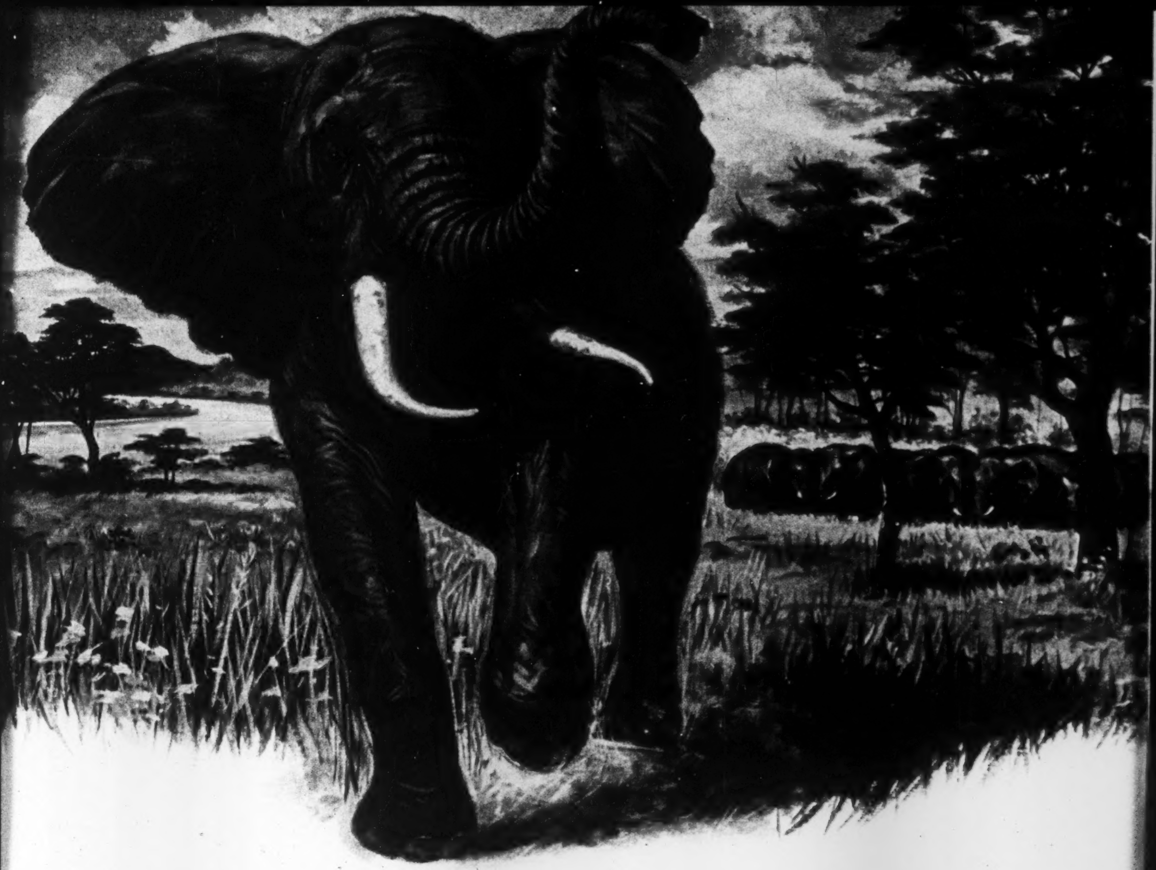
When a suitable sight for landfill operations can be acquired within a reasonable distance of the collection area, this method of disposal ordinarily provides the most economical and satisfactory method of refuse disposal for cities of the size of Madison. About 9.9 acres per year would be required, if the landfill averages a compacted depth of 8 ft. Another 1.17 acres would be required to accommodate the entire metropolitan area.

Capital cost of two landfills and necessary equipment at extreme ends of the city would total $190,500. Annual cost is estimated at $106,575.

Project 3-A, grinding into sewage flow, includes two garbage grinding and sorting stations, each comprising two grinders of 6-ton per hour capacity, a pit, a conveyor belt, facilities for discharge and a simple building.

Additions to the sewage treatment plant would include added aeration tanks, sludge digestion tanks, sludge thickening tanks, a new sludge control building, new elutriation tanks, added sludge bed area or vacuum filtration equipment and necessary outside piping. First cost of all these facilities is estimated at $1,517,000. Total annual costs are estimated $145,832.

If rubbish and ashes continue to go into controlled burning dumps, the total capital cost will be $75,000, and



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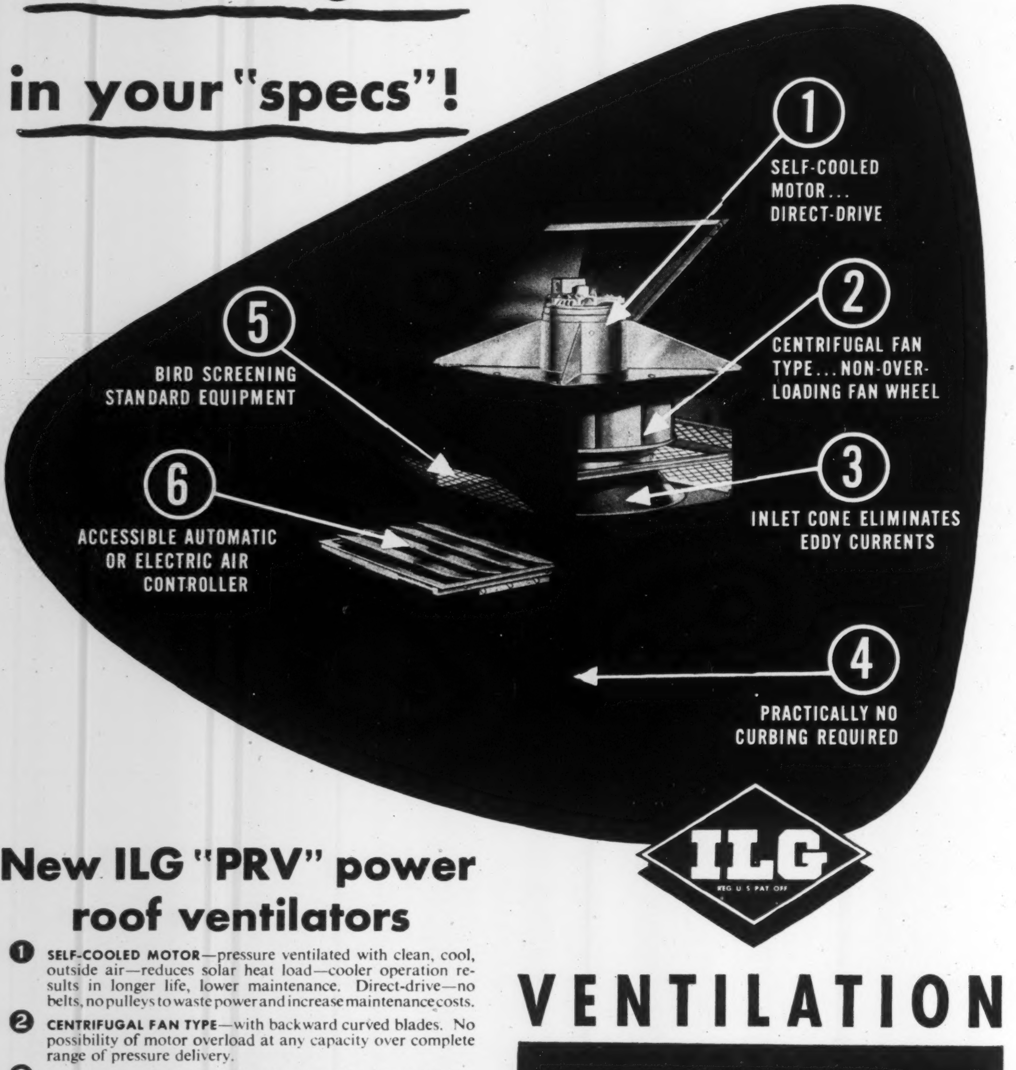
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the annual cost $24,904. If landfill methods are adopted for these, total capital cost would be $156,500 and annual cost $86,846. Because the burning dump is a nuisance at times, the engineers consider the landfill of other than garbage in comparing costs with the other disposal methods and come up with a total annual cost for Project 3-A of $232,678.

Project 3-B, a single grinder at the sludge digestion tanks of Nine Springs Sewage Treatment Works, would include the sorting and grinding station with a 12-ton per hour capacity and additions to sludge handling and disposal facilities. No additions to secondary treatment would be required. Capital cost for this project would be $857,000 and annual cost $86,881. The total figures including cost of landfill as disposal methods for the rubbish and ashes are $1,014,000 and $173,727.

• Comparison and choice—Summaries of projects' capital costs and annual costs are given in the tables. The range in cost for Project 2 shows the effect of varying distance from the collection districts to possible landfill sites. Prices of supervision and overhead, about $10,000, should be added to all annual costs.

Cost of Project 3-B is slightly lower in total annual cost than the more favorable of the incineration projects, but grinding of garbage is eliminated from consideration on the grounds that the method is less secure than better established methods. Adverse effect on sewage plant effluent is feared.

Incineration is considered more permanent and satisfactory than landfill, and any long range program should be based on the eventual construction of an incinerating plant. The landfill method can be put into effect quickly and at a lower first cost; however, its adoption does not prejudice the construction of other facilities at a later date.

The landfill project has lower annual cost than the single incinerator project when the average haul to the landfill sight is less than 7.5 miles. First cost of landfill is substantially lower than that of incineration, regardless of length of haul that is figured.

Comparison has been attempted from the standpoint of service rendered and suitability of disposal methods. The same frequencies of collection has been used for all projects, and disposal methods have been limited to those which can operate without nuicance or danger to public health. It is recognized that the total cost can be reduced by cutting down the frequency of collection and by continuing controlled burning of rubbish at dumps and confining the complete landfill operations to the disposal of garbage.

• Recommendations—These are the final recommendations of the engineers to the City of Madison: Landfill should be adopted as the method of refuse disposal. Separation by the householder of garbage and rubbish should be continued. Present methods of disposing of rubbish and ashes in controlled burning dumps should be continued and only garbage should be landfilled as long as controlled dumps are considered acceptable. The city should move to acquire another 200 acres of land suitable for fill within an average distance of 7.5 miles of the collection areas. Land should be set aside for possible future construction of incinerating plants. In planning, consideration should be given to provide a capacity for the entire metropolitan area.

Cost of classrooms under fire in California

A report of California's legislative auditor, A. Alan Post, severely criticizes the state's school construction program as costing too much per classroom.

The report was issued simultaneously with the convening of the legislature to consider a new state school bond issue.

A $250 million bond issue voted in 1949 is virtually exhausted and the need for additional classrooms is critical.

Post, who is the financial adviser to the legislature, said the inclusion of many multi-purpose rooms was the chief factor accounting for the high cost.

"Approximately 7,000 kindergartens, standard classrooms and special classrooms will be constructed under the program," the report by Mr. Post reads:

"This means $38,857 was spent for each classroom produced. It is calculated 14,945 classrooms could have been built at the fairly liberal figure of $18,200 per classroom, including necessary toilets, corridors, administration and other space. The difference of 7,945 classrooms would have housed an additional 278,075 children.

"Expressing this data another way, at $18,200 per room, 7,000 classrooms could have been produced at a cost of $127,400,000 instead of $272,000,000 (includes district funds.)"

Post's report pointed out that when local school districts built their own schools the cost per sq ft was $14.84 but the cost per sq ft on state aided projects was $19.18 according to his figures.

He urged the legislature to give serious consideration to the establishment of standards that would limit the extent of the state's participation in the cost of any school project, action which he feels would boost local participation and increase local incentive to secure economies in this type of construction.

Fluoridation costs cited as N. Y. city turns it down

By the close vote of 5 to 4, the Common Council of Syracuse, N. Y., killed a controversial proposal for fluoridation of the city's water supply on Aug. 4.

The step had been asked by the city department of health and recommended, after long study, by the city's health and parks committee.

The action was taken on a proposed ordinance directing the city engineer to prepare plans and specifications for a building at Skaneateles gate house to house supplies and machinery for fluoridation, at an estimated cost of $30,000. City Engineer Nelson F. Pitts had opposed the ordinance.

The report estimated an annual cost of 15¢ per capita.

• Who is using fluoridation?—The committee also reported that 12 communities in New York State and 318 in the nation now add fluorine to their water supplies.

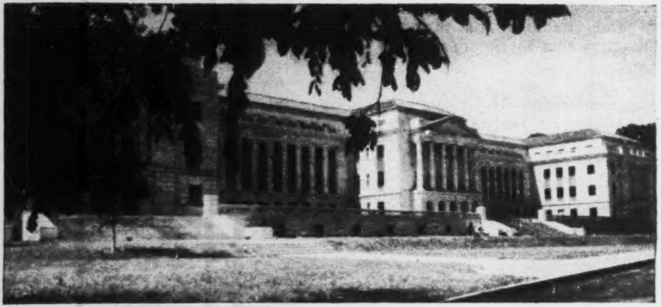
The 12 in the state are: Ardsley, Bronxville, Carle Place, Gloversville, Newburgh, New Rochelle, North Pelham, Olean, Pelham, Pelham Manor, Tuckahoe, and Westfield.

In addition the committee said fluoridation has been approved in 15 other New York communities: Amsterdam, Bath, Buffalo, Elmira, Fulton, Hoosick Falls, Hudson, Malverne, Penn Yan, Poughkeepsie, Rochester, Riverhead, Troy, Utica and Yonkers. Fluoridation of water in Newburgh has produced a 47% reduction tooth decay since 1944 among the school children of that city, Dr. Herman E. Hilleboe, New York State Health Commissioner reported last week.

Hilleboe compared Newburgh with nearby Kingston where no fluoridation is used.

The drop in tooth decay in Newburgh is based on data up to the middle of 1952. In Kingston there has been no change at all.

Hilleboe also reported that since the start of the study they have found ". . . absolutely no harmful effects from drinking fluoridated water."



CAPITAL ANNEX OFFICE BUILDING at Frankfort cost $20 per square foot

Monumental office cost analysis

Kentucky has just moved into it's new $6 million office building, equipped with air conditioning and other comforts for which the costs are reported here. J. B. Rieman is chief engineer, division of engineering, department of finance for the state Property and Buildings Comm.

Gross floor space is 300,820 sf, not including the new boiler house. Useable floor space is 255,491 sf. The office building alone cost $18 per gross sf and $21.22 per useable sf. Final completion costs, including the boiler plant, are $20 per gross sf and $23.65 per usable sf of floor space.

These contractors and their subcontractors did the job: George H. Rommel Co., Louisville, foundations and steel structure, with subs George E. Blandford, Louisville, on plumbing and sewage disposal and Wm. Hepburn, Lexington, on electrical work.

Struck Construction Co., Louisville, did the general construction with these subs: Michaels Artbronze, Covington, metal stairs and misc. metal; A. W. Martin, Columbus, Ohio, steel sub-floors; Louisville Builders Supply Co., damp-proofing and steel joists; General Bronze Corp, Garden City, N. Y., ornamental bronze; H. C. Smith Co., McKeesport, Pa., waterproofing, roofing and sheet metal; Winfrey Bros., Knoxville, Tenn., setting of limestone and granite; Peter & Burghard Stone Co., Louisville, marble, tile and granite; Anning-Johnson Co., Indianapolis, Ind., gypsum roof tile; Cutler Mail Chute Co., Rochester, N. Y., mail chute; Central Glass Co., Louisville, glass and glazing; Jos. D. Engelbert Co., Cincinnati, painting and finishing; Overhead Door Co., of Ky., Louisville, overhead doors; Chamberlain Co. of America, Shively, Ky., caulking; Building Products Dist., Louisville, fold doors; Steel Fabricators, Inc., Louisville, angle lintels; H. H. Robertson Co., Pittsburgh, Pa., steel sub-floors; Ingalls Stone Co., Bedford, Ind., limestone; Kister Lumber & Millwork Co., Louisville, millwork; Diebold, Inc., Canton, Ohio, ten vault doors; Belknap Hardware & Mfg. Co., Louisville, finished hardware.

Sauer Co., Inc., Columbus, Ohio did plumbing and sewage disposal; Johns-Manville, Phillip-Carey & Armstrong Cork, insulation; The John Van Range Co., Cincinnati, kitchen and cafeteria equipment.

B. A. Walterman Co., Cincinnati, did the heating and ventilating also refrigeration and piping and cooling water system with Armstrong the sub on pipe covering; Wm. Hepburn Co., the main electrical contract; Otis Elevator Co., Chicago, elevators; Peele Co., Brooklyn, N. Y., moving stairs.

On the Capitol boiler plant, Harry O. Wyse, Lexington, did alterations and additions, Henry Vogt Co., boiler, with subs: H. Berger & Sons, boiler setting, General Insulation & Roofing Co., insulation. Bert J. Waltrip supplied boiler feed pumps, with subs: Louisville Insulating Co., insulation and T. W. Nagel Electric Co., electrical work, all of Louisville.

Capitol office building

State Property and Buildings Comm.

Section of project	Total cost	% of total	Cost per sq ft of office space gross	useable
Office bldg.				
archts fee	$203,102	3.4	$0.68	$0.79
construction	5,422,020	89.7	18.02	21.22
Boiler house,				
archts fee	14,240	0.2	0.05	0.06
constr & equip	204,823	3.4	0.68	0.80
Misc	26,418	0.5	0.09	0.10
Reserve,				
xtras & over-runs	172,160	2.8	0.57	0.68
Total	$6,042,764	100.0	20.09	23.65

Construction of Main Building

Foundation and struct steel	$843,897	15.5	$2.80	$3.30
General constr work	2,953,064	54.4	9.82	11.56
Plumbing and sewerage	177,415	3.3	0.59	0.69
Heating and ventilating	514,075	9.5	1.71	2.01
Electrical work	455,239	8.4	1.51	1.78
Elevators	164,268	3.0	0.55	0.64
Moving stairs	37,592	0.7	0.12	0.15
Air conditioning	219,480	4.0	0.73	0.86
Cooling water system	56,989	1.2	0.19	0.23
Total	$5,422,020	100.0	$18.02	$21.22

Construction of Boiler House

Building	$55,997	27.4	.....	.....
Boiler	53,358	26.0	.....	.....
Boiler feed pumps, etc.	95,468	46.6	.....	.....
Total	$204,823	100.0	$0.68	$0.80

Miscellaneous

Sewer connections	$3,754	....	.....	.....
Venetian blinds	6,427	....	.....	.....
Cafeteria	8,905	....	.....	.....
Coal, janitor supplies, etc.	7,333	....	.....	.....

Coal towers and conveyers for New York power plant

The New York City Board of Transportation recently let two contracts for coal and ash conveying equipment for the 74th Street power plant. Contract 1 consists of two movable coal unloading towers each having a free digging capacity of approximately 450 long tons per hour and an average capacity of 300 long tons per hour.

Contract 2 consists of conveying equipment-- two coal conveying systems, each having a capacity of 300 long tons per hour; one ash conveying system, having a capacity of 50 short tons per hour; six automatic coal weighing scales, each having a capacity of 15 short tons per hour; one coal bunker conveyer, having a capacity of 60 short tons per hour; and one pivoted bucket ash conveyer system, having a capacity of 100 cy per hour.

The movable coal unloading towers run in a north/south direction along the East River on rails, 20-ft center to center on an elevated structure furnished under another contract. Each will remove slack and run-of-mine bituminous coal from barges by means of a grab bucket and crush and discharge coal onto either of two belts.

Unit prices are reported here for the low and high bidder on the various parts of the conveys and towers.

Conveying equipment

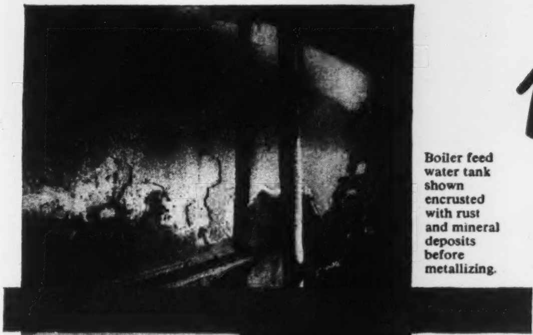
LB Link-Belt Co., New York City	$807,240
HBHewitt-Robins Inc., Robins Eng. Division, New York City	1,150,496

	1 sys		2 sys	
	LB	HB	LB	HB
Coal conv belt, 36"				
A	$41,989	$49,960	$41,930	$39,845
B	10,618	12,770	10,630	12,913
C	40,015	50,816	40,023	51,304
D	19,930	27,882	19,969	27,662
E	13,143	15,488	14,127	19,418
F	35,596	51,889	34,669	53,631
G	11,283	13,518	12,070	14,271
H	23,656	32,076	22,270	31,279

	LB	HB
Ash conv belts, 24" 1 sys		
1-R	10,764	13,214
2-R	10,769	13,214
3-R	10,764	13,214
4-R	10,769	13,214
1-S	12,512	8,025
2-S	25,106	8,025
Elec control sys. for coal	18,309	71,817
for ash	9,592	34,979
Two magnetic separator pulleys, two motor generator sets & one, elect control panel	15,763	26,012
Coal samplers & sample crushers, 2	16,289	24,066
Conveyor scales, 2	10,056	12,234
Movable belt trippers, 4	19,842	59,328
Shuttle carriages, 2	3,140	13,835
Retractable booms, 4	14,124	25,507
Automatic coal wt scales, 6	55,760	68,713
Coal bunker unload conv, 1	39,409	55,352
Pivoted bucket ash conv sys, 1	132,354	185,025

Movable coal unloading towers, 2

LBMcKiernan-Terry Corp., New York City	$1,398,700
HBHeyl and Patterson, Inc, Pittsburg, Pa.	1,602,000



Boiler feed water tank shown encrusted with rust and mineral deposits before metallizing.

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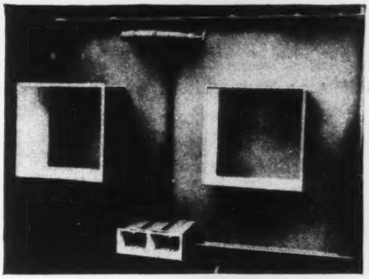
pure zinc coatings used on both fresh and salt water types

Feed water tank being metallized after preparation by grit blasting.

This 20-year old tank, used by a St. Louis brewery for boiler feed water supply, had become so badly scaled that it seemed ready for the scrap heap. Instead it was metallized with a .008" coating of pure aluminum, after being cleaned by grit blasting. Job was done between 6 P.M. one Friday night and 6 P.M. the following Sunday, during a plant shut-down. This tank is now good for another 15 years, at least. Work done by the St. Louis Metallizing Co.



Tuna clipper bait tank protected with Metco System #107. Normally necessary to scale and repaint every six months. Metallized tanks in service over four years without further maintenance.

Salt water bait tanks

The tank type shown here is used on west coast tuna clippers for salt water storage of live bait. Tank interiors are painted white to prevent the bait from killing themselves against the bulkheads. With paint alone, it is necessary to scale and repaint these tanks every six months. Tanks metallized in accordance with Metco System #107, which provides the desired white surface over .006" metallized zinc, have already been in service over 4 years without any further maintenance. (Photo courtesy Clark Metallizing Co.)

The Metco* Systems. These Systems are a series of 18 basic engineering specifications developed over 19 years of experience with pure zinc and aluminum coatings on many different types of structures and equipment. The Metco Systems provide the answer to standardization of surface preparation, metal coating thicknesses and organic after-coatings for various service conditions and appearance requirements.

Here are 10 Metco System contractors

The following organizations are set up to provide positive corrosion protection at lower annual cost in accordance with Metco System specifications. For further information, or copy of descriptive bulletin, contact the one nearest you.

* *Reg. U. S. Pat. Off.—Property of Metallizing Engineering Co., Inc.*

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Lincoln Pk. 25 (Detroit), Mich. **DIX ENGINEERING CO., INC.** 1417 Dix Road Tel. Dunkirk 1-8822	**Philadelphia 29, Pa.** **METALWELD, INC.** Fox & Hunting Park Ave. Tel. Radcliff 5-3471	**St. Louis 10, Missouri** **ST. LOUIS METALLIZING COMPANY** 625 South Sarah Street Tel. Newstead 5253	**Brooklyn, N. Y.** **ARTHUR TICKLE ENGINEERING WORKS, INC.** 21 Delevan Street Tel. Main 5-4200	**Houston, Texas** **F. W. GARTNER CO.** 3805 Lamar Avenue Tel. Atwood 5338

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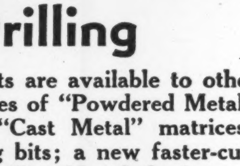

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AT THE JOHNSONVILLE PLANT, four of six generating units now being installed are in operation. When these units are completed this plant will be capable of producing 750,000 kw. Ultimately it is to have ten units.

TVA steam power plant costs

The nation's greatest expansion of steam power generating capacity is in the area served by the Tennessee Valley Authority. There, the five great plants now in various stages of construction will, when completed, be capable of producing over three million kilowatts of power, or three times the U.S. share of the much publicized St. Lawrence hydro project.

Due to the number of those plants, the estimates of the cost of the principal items going into them give an unusual record of the range that may be expected in such items in projected steam power stations in other regions. The principal cost items for the five TVA plants are given in the accompanying table.

Incidentally, despite the wide range in such an item as land cost between the Johnsonville station and the Kingston station, for example, the effect of such items on the unit cost per kilowatt for the several stations is small. And in comparing the unit costs in the table, it should be noted that the cost estimates for the Johnsonville plant were made about three years before estimates for the Shawnee, Kingston and Colbert plants. The cost of all construction rose sharply in those years, and that rise is reflected in the more recent estimates.

Costs at Shawnee are higher for another reason. It is located near the plant the Atomic Energy Commission is building at Paducah, which has raised wage rates and other costs above those elsewhere in the area served by TVA.

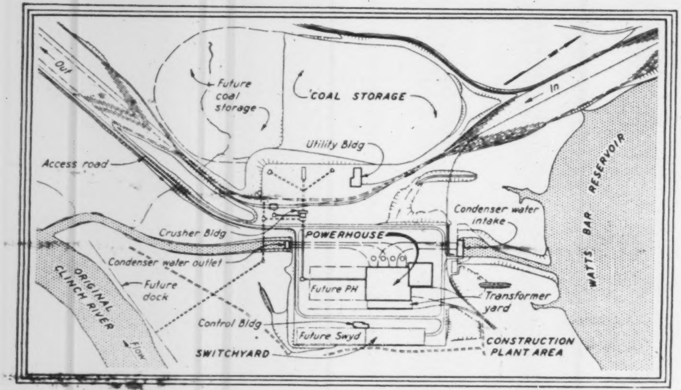
• Tables based on estimates—All figures given in the table of plant costs are estimates, not actual costs. However, judging by a comparison of the estimated costs for the Johnsonville steam plant with actual costs for work done to date, the final costs for the other plants should not be far out of line with estimated costs.

• Plants are similar—All five plants are similar in type of structure, framing and wall materials. The powerhouse substructures are of reinforced concrete, the superstructures have steel frames and walls of glass block, aluminum or asbestos protected metal siding in various combinations.

All are founded on rock except the Shawnee plant, which is located on the Ohio River a few miles west of Paducah, Ky. It is on sand and gravel. There is a somewhat wider range of water-surface fluctuations on the Ohio River than on the Tennessee River, where the other plants are located. This condition served to increase the cost of facilities for obtaining condenser water at the Shawnee plant.

All plants except Kingston are located on land classified as agricultural. The Kingston plant is located on land that had been subdivided and on which about 20 residences had been built. Also, because of the conformation of the river there, a much larger area of land had to be purchased there than for the other plants.

• Plant locations—The Johnsonville plant is located on the reservoir formed behind Kentucky Dam on the lower Tennessee River, about 8 miles east of Camden, Tenn. Widows Creek is on the reservoir behind Guntersville Dam, at the Mouth of Widows Creek, about 57 miles down river from Chattanooga. Its first unit went into operation in May of this year, and Unit No. 6 is expected to be on the line May 1, 1954.



LAYOUT OF THE KINGSTON PLANT showing provisions made for expanding the station from an original four units of 150,000 kw each to an ultimate of nine units to meet the steady growth of demand in that area. Four additional units, each capable of producing 200,000 kw, are now being installed.

Shawnee, as noted previously, is located on the Ohio near Paducah, and the Colbert plant is on the Tennessee River a few miles west of Muscle Shoals.

• **Typical plant details**—The Kingston plant may be taken as typical. Work on it started in April, 1951. Initially, four units each having a capability of 150,000 kw are being installed there. Provision is made for installation of five additional units of 200,000 kw, four of which are now on order. The ultimate capability of the plant will be 1,400,000 kw.

The main building for four units consists of a generator room 385 x 115 ft, a boiler room 358 x 141, and a shop 180 x 205 ft. The boiler room will be 111 ft high above ground with a basement 40 ft deep.

Turbogenerators in the Kingston plant will operate at 3,600 rpm and 18,000 volts, with steam pressure of 1,800 psi at 1,000 deg F. The generator stators will each weigh 168 tons.

There will be a reheat type of boiler for each unit capable of producing 1,020,000 lb of steam per hour. Under normal load, 870,000 lb are returned each hour to the boiler for reheat. Annual coal consumption will be 1,735,000 tons.

Circulating water pumps will draw 400,000 gpm from the Watts Bar reservoir north of the plant, which will be discharged into the Clinch River channel south of the plant for return to the reservoir.

The first units is scheduled to be in operation by May 1, 1953, with the others coming on the line at two month intervals. Cost of the four-unit installation will be about $85 million.

Provision for additional units has been made at each plant except Widows Creek. The six units being installed there are the plants' utilmate capacity.

Normally, provision for future expansion has little effect on the cost of the initial plant. However, at Shawnee, where six more units already have been authorized, some additional dredging and excavation was done in anticipation of that work.

Information on which this article is based was supplied by Harry Wiersema, assistant to C. E. Blee, chief engineer of the Tennessee Valley Authority, Knoxville, Tenn.

ESTIMATES OF COST OF TVA STEAM PLANTS

(In Thousands of Dollars)

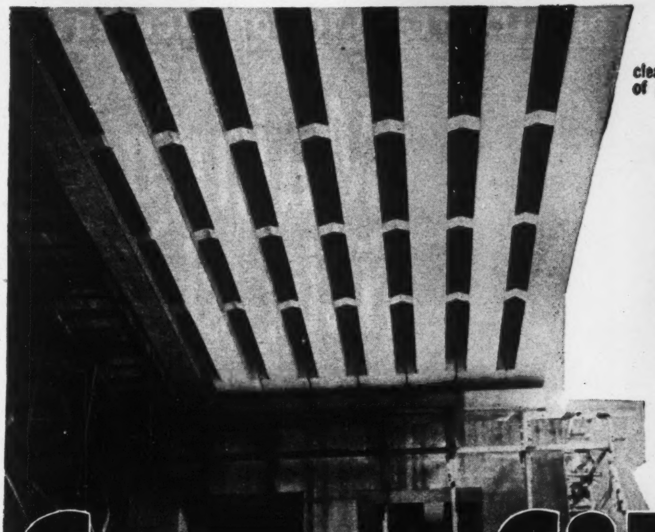
Plant **Number of units** **Capability (kw)**	**Johnsonville** **Six** **750,000**	**Widows Creek** **Six** **750,000**	**Shawnee** **Four** **600,000**	**Kingston** **Four** **600,000**	**Colbert** **Two** **400,000**
Land and land rights	$73	$143	$214	$1,312	$277
Structures & improvements	19,835	20,371	19,550	17,466	12,269
Boiler plant					
Coal handling & storing facilities	5,569	6,044	8,439	5,252	4,759
Main boiler plant	29,335	33,622	24,823	24,412	16,894
Turbo-generator plant					
Condenser cooling water system	4,269	3,137	6,946	4,754	2,221
Main turbo-generator plant	23,662	24,521	16,880	18,158	12,563
Accessory elect. equip.	7,007	7,702	5,727	6,645	4,326
Miscellaneous power-plant equipment	1,445	1,329	1,479	1,540	1,326
Transmission plant	6,669	5,980	4,169	5,334	4,192
Maintenance building	43	45	41	42	50
Communication equipment	93	106	232	85	123
	$98,000	$103,000	$88,500	$85,000	$59,000
Cost per kilowatt	$131	$137	$147	$141	$147

Canadians don't want Passamaquoddy power

The Canadian government has turned down the idea of sharing with the United States in an investigation of the old Passamaquoddy tidal power project on the border of New Brunswick and Maine, as had been suggested by the International Joint Commission some months ago. The estimated cost of the investigation was to have been about $3,900,000.

In 1936 the U. S. government started work on a project limited to Cobscook Bay in Maine, which was later abandoned as uneconomical. The proposed study would include the much larger international scheme.

It is considered in Canadian governmental circles that, although practicable from an engineering point of view, the scheme is not economically sound. A further objection is that a start has been made at developing hydro power on the St. John River of New Brunswick, where a first plant is approaching completion on the Tobique tributary of the main stream, with other plants in the planning stage. These new water power plants will serve the area and industries which might be expected to use some of the Canadian share of Passamaquoddy power, should it ever be developed.



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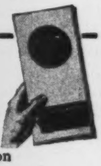

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- **Handles 21 full ounces of any type grease!**
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Easy to fill and operate, this heavy-duty lever-type gun is built for rugged wear and trouble-free service. Specifically designed for the construction industry. Has loader fitting for easy refilling without disassembly. Ask for Alemite Model 6679-J. Hose Model 6829-A.

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Designed for use with 100 lb. drums. Keeps lubricants "refinery clean" from barrel-to-bearing. Ends all risk of dirt or contamination. Actually saves up to 3¾ man-hours for every 100 lbs. of lubricant used. Ask for Alemite Model 7198-L.

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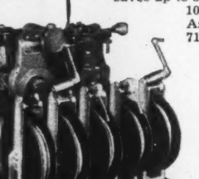

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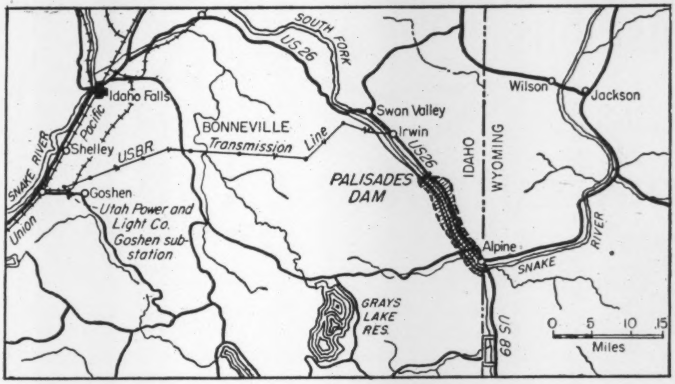
UNIT PRICES BID BY CONTRACTORS



Dam, powerplant and roads, Idaho

The $29-million Palisades Power project, under construction by the Bureau of Reclamation on the South Fork of the Snake River, Idaho, consists of an earth-fill dam, 260-ft high and 2,000-ft long; a reinforced concrete and brick powerplant; and the relocation of Idaho State Highway 26 and 18 miles of forest service road. Work includes a spillway—an unlined open-cut inlet channel, a concrete inlet structure with two radial gates, a 28-ft concrete lined tunnel, and a concrete lined outlet channel; an outlet works – a concrete intake structure with fixed-wheel gate; and a power intake structure with fixed-wheel gate.

Four 39,000 hp hydraulic turbines will be installed in the 100 by 246-ft powerhouse. K. G. Maier B. Maschinerfabrick, Brackwede, West Germany company, was the low bidder for the turbines with a bid of $1,385,810. The award went to S. Morgan Smith Co., York, Pa. for $1,421,700.

A DO-H3 priority rating is available to the contractor for the job and 1,375 tons of carbon steel plates, 70 tons of carbon steel structural shapes and 550 tons of other carbon steel has been allotted for the third quarter of 1952 for the job.

Included in the government furnished materials are 200,000 pounds of reinforcement bars, oil storage tanks, radial gates and hoists, fixed-wheel and bulkhead gates and hoists, ice prevention air systems, and draft-tube pier noses.

Completion schedules and liquidated damages are: clearing borrow area K 180 days, $100 per day; relocation of Idaho State Highway No. 29, 550 days, $150 per day; relocation of forest service road, before diversion if the river through the outlet tunnel, $100 per day; powerplant structure, switchyard and cable duct and access road to powerplant, 1,310 days, $600 per day; and the remainder of the work, 1,950 days, $100 per day.

Hourly wage rates for this project are: bricklayers, $2.75; carpenters, $2.20; cement finishers $2.475; electricians, $2.365; ironworkers, $2.285 to $2.365; painters, $2.50 to $2.75; plasterers, $2.75; plumbers, $2.475; power equipment operators, $1.75 to $2.60; sheet metal workers, $2.25; truck drivers, $1.55 to $2.35; line construction workers, $1.485 to $2.615; and common laborers, $1.65 to $2.14.

Bidders include:

1C	J. A. Jones Constr. Co., and C. H. Thomkins Co., Seattle	$29,180,346
2	Winston Bros. Co, Foley Bros. Inc., Donovan Constr. Co., C. F. Lytle Co., Johnson-Drake & Piper. Inc., Al Johnson Constr. Co., Minneapolis	30,430,203
5	Guy F. Atkinson Co., Chas. L. Harney, Inc., A. Teichart & Son Inc., Bressi & Bevanda Constr.'s, W. E. Kier Constr. Co., S. San Francisco	34,193,705

Bids: 4-10-52 Items	Unit	Quantity	Unit prices 1 C	Unit prices 2
Diversion & care of river during constr & unwater fndn	ls	1	$1,050,000	$1,108,000
Clear borrow area K	ac	190	$450.00	$675.00
Exc, open-cut, at dam common	cy	572,000	0.89	1.15
over 572,000	cy	572,000	0.53	0.50
s&t dam embank	cy	585,000	1.08	1.55
over 585,000	cy	585,000	0.67	0.67
Exc, open-cut, at dam rock	cy	210,000	4.15	4.40
over 210,000	cy	210,000	3.50	2.75
Exc, all cls, cut-off	cy	760	20.00	35.00
spillway tunnel	cy	52,000	17.00	18.40
inclined shafts	cy	18,600	22.00	22.00
Exc, exist rock-fill stock pile	cy	120,000	0.95	0.90
Permanent struct stl tun supts & liner plates, lagging	lb	1,739,000	0.14	0.20
Tun reef supt belt	lf	5,000	5.00	1.00
Exc, strip bor area	cy	690,000	0.35	0.32
Exc com, bor area K & trans to dam	cy	1,770,000	0.74	0.60
over 1,770,000	cy	1,770,000	0.45	0.32
Exc com, bor area L & s&t to dam	cy	643,000	0.82	1.60
over 643,000	cy	643,000	0.49	0.65
Exc com, bor area M & s&t to dam	cy	1,500,000	0.86	1.15
over 1,500,000	cy	1,500,000	0.47	0.45
Exc com, bor area M & trans to dam	cy	1,839,000	0.57	0.90
over 1,839,000	cy	1,839,000	0.29	0.37
Exc com, bor area N & trans to dam	cy	1,000,000	0.71	0.70
over 1,000,000	cy	1,000,000	0.43	0.37
Placing topsoil	cy	50,000	0.40	0.50
Backfill	cy	49,000	0.76	0.55
Fill exist test pits & explor shafts, tun & trenches	cy	1,000	20.00	6.00
Earth fill, dam embank zones 1 & 2	cy	8,675,000	0.16	0.20
special compact	cy	2,500	3.00	3.00
Sand, gravel, & cobble fill, dam embank. zone 3	cy	3,569,000	0.09	0.11
special compact	cy	4,450	2.00	3.00
Bkfill dam embank zone 4	cy	873,000	0.11	0.11
Cobble & boulder blanket	cy	258,000	0.50	0.35
Sand, gravel & cobble blanket	cy	50,000	0.70	0.22
Placing riprap	cy	268,000	0.70	0.25
Sewer pipe, 8" embank tee uncmt jts	lf	500	3.00	2.00
12"	lf	3,000	3.75	2.40
18"	lf	800	5.50	3.80
Reinf conc pipe, 36" & inspect wells	lf	200	14.50	11.00
Inspect well conc bases & covers	ea	10	100.00	45.00
Sewer pipe, 4" drains uncmt jts	lf	2,780	6.65	1.20
6"	lf	6,430	7.00	1.30
8"	lf	1,430	7.30	2.00
4" cmt jts	lf	310	6.30	1.30
6" cmt jts	lf	315	6.40	2.00
8" cmt jts	lf	450	6.60	2.50
12" cmt jts	lf	85	7.20	3.00
15" cmt jts	lf	50	7.80	5.00
CM pipe, 12"–14 gage	lf	330	8.00	6.00
Clay drain tile, open jt, embed in grav	lf	200	2.00	3.00
Drain holes	lf	3,000	10.00	6.20
Grout holes in stage 0' to 35'	lf	59,000	2.30	2.75
35' to 60'	lf	1,750	2.40	2.80
60' to 110'	lf	2,900	2.50	2.75
110' to 160'	lf	1,000	2.60	2.75
Stnd black pipe & ftngs for conc cool sys & fndn grouting	lb	30,000	0.70	0.50
Stnd zinc-coated pipe & ftngs & special grout outlets	lb	12,500	0.75	0.72
Hook-up to grt holes	ea	2,220	7.00	4.80
Pressure grouting	sk	32,400	2.60	1.90
with packers	sk	42,000	2.75	2.15
jts & cooling sys	sk	800	10.00	4.00
Holes for anchor bars grt bars in place	lf	68,000	1.80	1.10
Reinf bars, furn	lb	13,000,000	0.095	0.085
place	lb	13,200,000	0.045	0.035
welding	ea	400	2.00	9.00
Conc intake struct below el. 5630	cy	8,100	55.50	37.50
above el. 5630	cy	390	80.00	60.00
beams slabs & gird.	cy	2,140	170.00	76.00
blockouts	cy	185	250.00	95.00
Conc, lining outlet & power tunnels	cy	25,950	23.00	30.00
inclined shafts	cy	2,400	60.00	47.00
Conc, conduits	cy	3,500	42.00	35.00
diver chanl lin	cy	2,100	39.00	42.00
2nd stage diversion adits	cy	6,400	20.50	35.00
penstock & outlet pipe encase & outlet works contr house substructure	cy	23,550	20.50	30.00
outlet works control house	cy	720	100.00	80.00
Conc, still basin floor	cy	7,280	24.00	25.00
counter ft. walls	cy	2,830	48.00	40.00
wall slabs	cy	3,075	59.00	60.00
Conc, cut-offs	cy	750	20.50	26.00
dam embank cut-off walls, except footings	cy	500	100.00	85.00
spill inlet struct below count walls	cy	1,120	24.00	23.00
floors	cy	1,240	24.00	23.00
lining	cy	4,015	44.00	30.00
walls	cy	380	120.00	90.00
highway bridge, operating bridge, compressor house & center pier above el. 5570	cy	1,175	62.00	50.00

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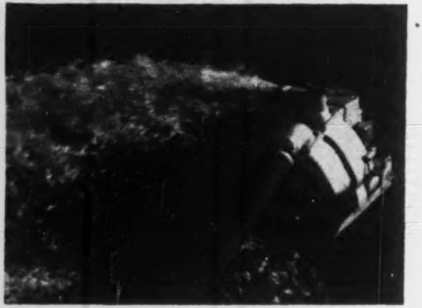
For Cost Conscious Contractors...

HOMELITE COST-CUTTING



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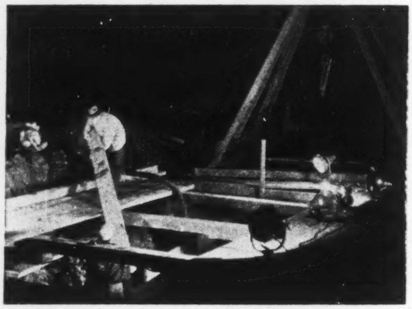
Generators

Operating power tools or floodlights with a Homelite Gasoline Engine Driven Generator gives you maximum possible savings. In the first place, you eliminate the cost and delays involved in having local power installed. But of even greater importance, with your lightweight Homelite set up right where you're operating tools, you eliminate long power-hungry cables that reduce the efficiency of your power tools and cause excessive repairs. Built for heavy duty service, a Homelite supplies plenty of power. It has a large overload capacity and is famous for its dependability.



Chain Saws

Clearing construction sites is a fast, low-cost operation with a *27 pound, 4 horsepower* Homelite Chain Saw. In fact, one man with a Homelite Chain Saw can cut more trees in a day than several men could cut with axes or hand saws. Lightweight, easy to handle . . . on every type of cut, felling, bucking, notching or trimming . . . a Homelite cuts through an 18 inch pine in 16 seconds . . . an 18 inch oak in 28 seconds . . . and it handles trees 48 inches or more in diameter.

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Idaho project

Continued from preceding page

Bids: 4-10-52 Items	Unit	Quantity	Unit prices 1 C	2
Conc, lining of spillway incl shaft & tun.	cy	19,800	30.00	30.00
spill-outlet-channel lining	cy	1,250	54.00	38.00
spill-outlet-channel gravity walls	cy	1,820	25.00	28.50
Backfill conc for power plant substruct	cy	2,250	20.00	23.00
Firststage conc in pp[2]				
substruct	cy	7,450	33.00	33.00
intermed struct	cy	7,600	59.00	36.00
superstruct	cy	260	130.00	90.00
Conc, pp struct				
2nd stage	cy	6,350	24.00	23.00
blockouts	cy	40	220.00	100.00
sills	lf	620	4.00	4.00
Conc, cable duct	cy	160	150.00	95.00
training walls	cy	1,150	55.00	56.00
dumped riprap	cy	220	17.00	15.00
Cooling conc	cy	6,400	1.40	2.20
Contr jts, type A	lf	220	2.80	4.00
type B	lf	30	2.80	2.00
Corkbd jt fill, 1"	sf	9,000	1.40	1.40
1/2"	sf	60	0.70	2.00
Bit jt fill 3/4"	sf	110	1.40	2.00
Rubber water stops*	lf	5,270	2.40	1.20
Metal water stops	lf	4,200	4.00	2.30
Metal seals	lf	700	4.00	3.40
Asphalt seals	lf	350	11.00	6.00
Rubber jt strips*	lf	900	1.40	1.05
with metal straps*	lf	50	2.80	2.70
Recesses for lighting panel boards, misc power boards, & other elect equipment	ea	13	15.00	18.00
Precast conc roof slab	sf	17,000	0.90	1.20
Roof insulation	sf	22,600	0.55	0.50
Coal-tar-saturated-felt roofing	sf	24,800	0.55	0.36
Membrane waterproof	sf	4,400	0.75	0.85
Asphalt-emulsion dampproofing, 2 coat	sf	650	1.90	1.80
Steel swinging doors	sf	300	12.50	10.00
Stl windows				
vent	sf	560	5.50	5.20
without vent	sf	2,300	5.50	4.60
Fixed stormproof louvers	sf	160	5.50	7.30
adjustable louvers*	sf	40	2.00	3.00
Brick walls pp struct	sf	32,500	3.80	5.00
Brick veneer walls outlet works contr house	sf	2,400	2.80	5.00
Brick walls, 12 1/2" for outlet works contr house	sf	6,400	3.80	5.00
Struct-stl bldg fram pp superstruct	lb	1,314,000	0.06	0.05
Insulated metal sidewall wall panels	sf	740	1.40	2.90
Embedded metal frames*	lb	13,500	0.28	0.20
Gratings; slot, hatch & manhole covers*	lb	77,000	0.20	0.11
Corkbd insul hatch cover	sf	2,400	1.40	0.60
Anchor bolts*	lb	110,000	0.31	0.28
Pipe hand-railing*	lb	3,300	0.30	0.20
Oil storage tanks*	lb	34,000	0.06	0.05
Chain-link fences	lf	2,000	4.00	3.75
Track rails & hoist trolley beams*	lb	72,500	0.09	0.02
Access hatchway roof	ls	1	200.00	630.00
Slotted metal inserts*	lb	4,300	0.30	0.80
Trashrack metalwork*	lb	810,000	0.07	0.07
Trash rake assembly*	lb	40,000	0.11	0.11
Ladders*	lb	6,500	0.28	0.24
Draft-tube pier nones*	lb	53,000	0.08	0.18
Misc metal-work*	lb	26,000	0.35	0.30
Outlet & powertun lin.	ls	1	$750,000	$830,000
Penstock & outlet pipe manifolds*	lb	3,000,000	$0.15	$0.13
Radial gates*	lb	380,000	0.125	0.07
hoists*	lb	84,000	0.08	0.085
Frames, seats & guides fixed-wheel & bulkhead gates, trash rake & stop logs*	lb	400,000	0.15	0.17
Fixed-wheel & bulkhead gates*	lb	668,500	0.06	0.10
Fixed-wheel gatehoist*	lb	150,000	0.09	0.13
contr equip & piping*	lb	4,000	0.55	0.34
Ring-fellower & outlet gates*	lb	1,320,000	0.09	0.06
Butterfly valves*	lb	1,200,000	0.08	0.10
Hollow-jet valves*	lb	230,000	0.09	0.12
Cranes & hoists*	lb	290,000	0.09	0.12
Embed pts fturbines*	ls	1	$110,000	$85,000
Met pipe ftngs & val smaller than 6"*	lb	13,500	0.36	0.30
6" & larger*	lb	40,000	0.30	0.24
CI soil pipe, ftngs, & floor drains	lb	33,000	0.40	0.47
CI bell & spigot & flanged pipe, ftngs, & valves	lb	47,000	0.60	0.42
Stl pipe & weld ftngs	lb	6,600	0.40	
Stl pipe & screwed flanges, ftngs & roof drains	lb	8,000	0.40	0.50
Embed airvent pipes*	lb	86,000	0.15	0.16
Ice prevent air sys*	lb	9,500	0.35	0.40
Embed met conduit,				
1/2"	lf	600	1.40	1.00
3/4"	lf	8,200	1.50	1.10
1"	lf	5,500	1.60	1.35
1 1/2"	lf	5,200	1.70	2.10
2"	lf	2,700	3.00	2.50
2 1/2"	lf	1,500	3.50	3.50
3"	lf	500	4.10	4.40
3 1/2"	lf	250	5.30	5.20
4"	lf	50	6.50	6.00
nonmet conduit, 3"	lf	435	2.40	2.20
nonmet conduit, 4"	lf	365	3.00	2.80
Grnd cables & rods & grnd connect in pp and tailrace	lb	13,000	1.70	1.80
Grnd cable adjacent to switchyd cable duct	lb	350	2.40	1.80
Grnd cables & rods in contr house, compressor & hoist house	lb	530	1.80	1.80
Power contact conduct for 150-t crane*	lb	3,500	0.30	1.80
Crane-trolley conduct sys in outlet-works control house*	lb	475	1.00	1.80
Power receptacle outlet 460-V, enclosures & matching plugs	ea	10	100.00	50.00
Embed light fix, conc	ea	16	100.00	50.00
in brick	ea	16	100.00	50.00
Gravel surfacing	cy	6,000	3.50	0.50
Conc. guard posts	ea	300	15.00	13.00
Holes, 1 1/2" for piezometer apparatus	lf	1,400	11.00	2.00
Piezometer tubing in dam embank*	lf	96,000	0.25	0.05
Trench test apparatus	cy	1,500	4.00	5.50
Settlement apparatus in dam*	lb	1,750	4.00	1.20
Test apparatus in dam terminal well*	ls	1	$4,000	$850
Surf settlement points on dam*	ea	32	$15.00	$11.00

* Government furnished

[1] Separate and transport

[2] Powerplant

Relocation of Idaho State Highway No. 29

Items	Unit	Quantity	Unit prices 1 C	2
Clear right-of-way	ac	75	$400.00	$40.00
Exc, for rdway, com	cy	1,500,000	0.40	0.45
rock	cy	195,000	1.55	1.80
Hiway embank, zone 2	cy	635,000	0.50	0.45
Watering	M gal	74,000	1.75	1.40
Roll embank	R hr	18,000	7.50	11.50
Overhaul	mi cy	850,000	0.25	0.165
Furrow ditch	lf	6,900	0.40	0.40
Exc, all classes for struct	cy	4,300	3.00	4.40
Compacted bkfill	cy	4,000	2.50	3.70
Crushed rock or grav blank under riprap	cy	600	4.50	2.20
Dumped riprap	cy	100,000	2.25	1.90
Hand-placed riprap	cy	100	20.00	7.50
Retaining walls	cy	65	100.00	52.00
Culv pipe, 18"—cls A	lf	186	4.50	4.00
24"—cls B	lf	664	6.50	5.00
CM pipe, 24"-16-gage	lf	96	5.50	4.50
14-gage	lf	772	6.50	5.00
10-gage	lf	400	10.00	8.30
36"-8-gage	lf	268	17.00	15.00
48"-12-gage	lf	928	17.50	15.00
48"-8-gage	lf	386	23.00	20.00
84"-1-gage, multiple plate	lf	580	75.00	77.00
CM embank protect	ea	4	30.00	50.00
CM embank pipe, 8"-16-gage	lf	200	2.50	2.10
Grout cobble gut	sy	2	20.00	30.00
Guardrail	lf	10,000	2.80	3.80
Guide posts	ea	90	11.00	10.00
R-O-W markers	ea	55	11.00	14.00
Max crushed-rock surf, 3/4"	t	22,600	2.90	3.00
Liquid asph MC-2	t	90	75.00	60.00
MC-4	t	75	75.00	60.00
Cover coat mater	t	2,350	5.00	7.60

Relocation of Forest Service Road

Items	Unit	Quantity	Unit prices 1 C	2
Clear right-of-way	ac	120	500.00	365.00
Exc, for rdway, com	cy	276,000	0.45	0.50
rock	cy	51,000	2.00	1.80
overhaul	mi cy	50,000	0.30	0.22
all cls for struct	cy	3,800	3.00	4.40
Compacted bkfill	cy	1,300	2.50	3.70
Dry-rock paving	sy	170	13.00	7.00
Pipe, 15"	lf	3,066	4.00	3.00
18"	lf	692	4.50	3.50
24"	lf	756	6.50	5.00
36"	lf	484	11.50	11.00
60", conc hd-walls	lf	36	50.00	32.00
Right-of-way fence	lf	10,000	0.45	0.30
Gravel surfacing	cy	15,500	3.00	1.40

Transmission line, Iowa

Bids were taken in three parts for a Missouri River Basin Reclamation Transmission Line Project which will carry power from Fort Randall Dam, S. D. to Sioux City, Iowa. Schedule 1 consists of constructing auger, pad, caisson, and timber-pile footings; schedule 2, erecting steel towers; and schedule 3, stringing conductors and overhead ground wires. The transmission line is a 230,000-volt, 3-phase, 60-cycle, steel tower line, 120 miles long. Work includes the installation of only one circuit (three conductors) of the double-circuit line and two overhead ground wires.

The government is furnishing stub angles for tower footings, reinforcement bars, structural-steel members for the towers, with all bolts, nuts, locknuts, washers, and step bolts, and bird guards and pans.

The footings for the line between Fort Randall and James River must be complete in 330 days; footings between James River and Sioux City, 450 days; schedule 2, 780 days; and schedule 3, 810 days. Liquidated damages for all work are set at $100 per day.

Bidders include:

1C	Lipsett Inc., New York City	$1,657,745
2	Donovan Constr. Co., St. Paul, Minn.	1,908,360
4	Hallett Constr. Co. & Continental Co., Dayton, Ohio	2,378,082

Bids: 6-25-52 Items	Unit	Quantity	Unit prices 1 C	2

Schedule 1

Items	Unit	Quantity	Unit prices 1 C	2
Clear & right-of-way	ls	1	$80,000	$4,640
ROW fences, prefab gates	ea	20	$100.00	$94.00
barbed-wire gates	ea	50	46.50	53.00
Fence grnd posts & grndg.	ea	700	6.00	7.20
Exc, tower sites	cy	2,000	1.00	2.35
type B footings	cy	450	6.00	7.00
type C-1	cy	4,130	4.00	5.40
type A, 30" dia	lf	11,880	2.00	1.65
type A, 36" dia	lf	480	6.00	2.60
type S and S-1, 30" dia	lf	19,600	10.00	2.10
bells, type A footings	ea	1,360	10.00	3.50
bells, type S footings	ea	680	10.00	7.70
caps, type PT footings	cy	340	4.00	17.75
Furn treated timber piles, below cut-off, 40' & less	lf	8,000	1.75	3.30
41' to 60'	lf	6,000	2.20	4.15
Drive vert tr timber piles	lf	5,500	2.50	3.80
batter tr timber piles	lf	8,500	2.75	5.00
Steel stubs for tower ftngs	ea	2,516	15.00	17.00
Cement	bbl	12,000	8.85	10.70
Reinforcement bars	lb	1,330,000	0.09	0.076
Conc, type A footings	cy	2,810	32.00	47.00
type B & C-1	cy	1,000	35.00	44.00
type S & S-1	cy	3,770	40.00	69.50
caps, type PT footings	cy	525	35.00	72.00
Blockouts in tower footings	lf	6,600	2.00	3.20
concrete	cy	200	30.00	85.00
Tower ground rods, connecting wire and fittings	ea	2,516	15.00	16.50

Schedule 2

Items	Unit	Quantity	Unit prices 1 C	2
Erecting steel towers	lb	17,600,000	0.0355	0.0434

Schedule 3

LB	Donovan Constr. Co., St Paul	$1,113,762
2	Hallett Constr. Co. & Continental Co.	1,234,674

Items	Unit	Quantity	Unit prices LB	2
Three 795,000 circ-mil ACSR conductors	line mi	122	$6,000	$6,800
Vibration dampers on conduct.	ea	3,702	$10.00	$14.00
Single-string susp insulator assy, 16 insulator units	ea	1,842	83.00	75.00
Double-string tension insulator assy, 17 insulator units	ea	72	220.00	200.00
Two 1/2" galv-stl overhead ground wires	line mi	122	$1,200	$1,200
Vibration dampers on overhead ground wires	ea	4,936	$6.00	$11.00

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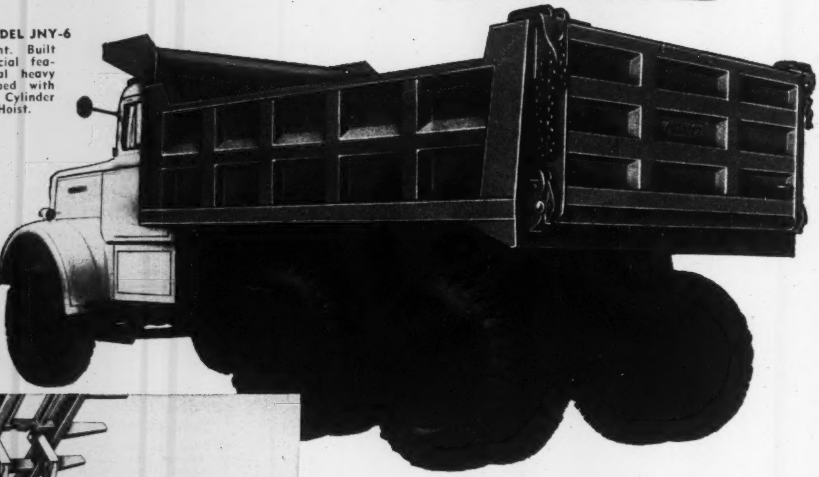
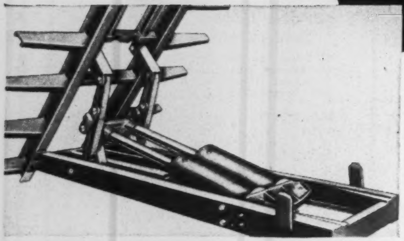
ANTHONY MODEL JNY-6
Pictured at right. Built with many special features for general heavy hauling. Equipped with Anthony Twin Cylinder "Power-Speed" Hoist.





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Anthony Bodies are designed to utilize the strength of high tensile steel and new engineering techniques, rather than with material weight, to give the *Lightest Weight Without Sacrificing Maximum Strength—Payload—Life!*

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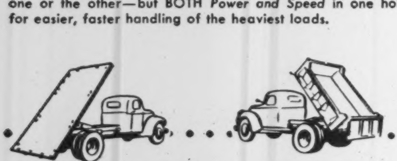

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ANTHONY COMPANY
STREATOR, ILLINOIS

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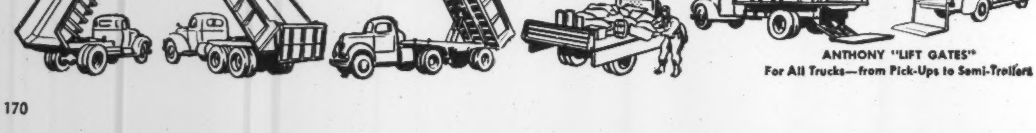


ANTHONY "LIFT GATES"
For All Trucks—from Pick-Ups to Semi-Trailers

Structures and roadway for Utah highway relocation

The Lagoon-Layton highway project on U. S. 91 near Kaysville, Utah, was let in two parts. Two 20-ft concrete structures and approaches attracted nine bidders. The low bidder was 20% below the engineer's estimate. Four contractors went after the six-mile graded and drained roadway portion. All bids were above the engineer's estimate. The surfacing will be let at a future date.

E. G. Johnson is the chief state highway engineer; O. Donald Miles, chief draftsman.

Skilled labor minimum wage rates range from \$2.05 to \$2.325; intermediate labor from \$1.60 to \$2.175; and unskilled labor from \$1.50 to \$1.625.

Two hundred working days were alloted for the first contract and one hundred and sixty-five for the second. Unit prices are shown here for both contracts.

Bidders include:

Structures

1C	Gibbons & Reed Co, Salt Lake City	\$181,755
2	F. R. Knowlton & Sons, Layton, Utah	188,912
9	W. W. Clyde & Co., Springville, Utah	270,489

Bids: 12-4-51 Items	Unit	Quantity	Unit Prices 1 C	 2
Graded Side Approaches				
Exc, unclassified	cy	12,000	\$0.30	\$0.35
Overhaul, cls A	stay	84,000	0.015	0.015
Watering	M gal	250	2.30	1.00
Rolling	hr	175	6.00	5.00
Water equip, furnish	ls	1	500.00	500.00
Constr signs, furnish	ls	1	200.00	500.00
Two Concrete Structures*				
Exc, for structures	cy	800	2.85[1]	1.75[1]
Concrete, cls A	cy	880	50.00[2]	52.00[2]
Reinforced steel	lb	296,100	0.11	0.12
Structural steel	lb	4,650	0.30	0.40
C.G.M. pipe, perf, 8"	lf	282	1.65	2.00
12"	lf	212	2.90	2.50
Piles, untreated	lf	6,780	2.30	2.30
Test pile, 14"	lf	75	8.00	3.00
Loading test	ea	2	500.00	350.00
Pile driving equip	ea	1	500.00	450.00
Lighting system	ls	1	\$1,580	\$2,000
Gravel bkfill	cy	60	\$3.45	\$5.00
Steel handrail	lf	268	11.50	13.00
Piles, treated	lf	8,050	2.65	2.55

* Unit prices are combined for the two structures as excavation and concrete prices were the only differences

[1] For 600 cy of excavation for one structure, the unit prices were 1 C, \$1.67 and 2, \$1.75

[2] For 1,018 cy of class A concrete, the unit prices were 1 C, \$47.00 and 2, \$50.00

Roadway

1C	Strong Company, Springville, Utah	\$796,040
2	Gibbons & Reed Co., Salt Lake City	846,598
4	Vinnell Co. Inc., Alhambra, Calif	1,029,043

Bids: 4-22-52 Items	Unit	Quantity	Unit Prices 1 C	 2
Select mat base crse	cy	182,000	\$0.613	\$0.61
Exc, unclassified	cy	156,500	0.23	0.27
Imported borrow	cy	675,000	0.23	0.34
Overhaul, class A	stay	5,351,000	0.012	0.01
class B	yd mi	1,256,000	0.12	0.11
Watering	M gal	14,500	0.50	1.70
Rolling, tamp roller	hr	6,700	6.00	8.00
pneumatic tire or power	hr	1,000	8.00	7.00
C.G.M. pipe, 8"	lf	300	2.00	2.30
12"	lf	600	2.80	2.85
C.G.M. perf, underdr, 12"	lf	1,134	3.00	3.00
C.G.M. pipe, 15"	lf	450	3.20	3.25
24"	lf	160	5.60	5.75
24"-soldered jts	lf	168	7.00	7.00
36"-soldered jts	lf	144	12.00	12.00
48"	lf	165	17.00	15.00
Concrete pipe, 18"	lf	2,080	4.50	4.45
24"	lf	5,798	5.80	5.90
36"	lf	546	12.00	11.25
42"	lf	69	17.00	14.25
72"	lf	198	37.50	33.00
Concrete pipe syphon, 24"	lf	270	9.00	7.00
C.M. pipe arches 22"x13"	lf	48	3.80	5.00
36"x22"	lf	168	7.20	7.50
Channel exc	cy	10,200	0.65	0.77
Exc, for structures	cy	5,250	3.00	1.15
Conc, class A	cy	255	85.00	81.00
class B	cy	14	80.00	81.00
Reinf steel	lb	33,150	0.20	0.16
Structural steel	lb	15,150	0.50	0.40
Mechanical tamping	hr	4,100	3.50	7.45
Remove exist conc pavement	sy	2,500	0.85	1.25
Slide headgate	ea	1	100.00	110.00
Clearing & grubbing	ls	1	\$6,000	\$5,000
Right of way markers	ea	93	\$7.00	\$6.00
fence, type A	lf	3,700	0.21	0.34
fence, type B	lf	28,900	0.27	0.36
fence, type D	lf	2,250	0.27	0.38
Chain link fence	lf	4,620	2.60	2.30
Gates, 10'	ea	8	25.00	45.00
14'	ea	4	30.00	47.00
16'	ea	24	35.00	48.00
Furn water equip	ls	1	\$2,000	600.00
Furn constr signs	ls	1	1,000	\$1,000

Bituminous plantmix used for Idaho highway

Grading, draining and plant mix bituminous surface for 13.7 miles of Idaho state highway between Boise and Mt. Home brought a low bid of \$952,511—just 2% below the engineer's estimate. The project, a relocation of U.S. 30, is two lanes of a future four lane highway.

It is 10 miles from a railhead and the contractor plans to use special hauling equipment to keep within the lawful limits.

Hourly wages to be paid are: skilled labor, \$1.60; semi-skilled, \$1.25; and common, \$1.10.

Work began in June and must be complete in 250 working days.

Bidders include:

1C	Duffy Reed Constr. Co., Twin Falls, Idaho	\$952,511
4	Peter Kiewit Sons', Sheridan, Wyo	1,064,215
2	McNutt Bros., Eugene, Oregon	1,305,305

Bids: 6-24-52 Items	Unit	Quantity	Unit Prices 1 C	 2
Removal of bridge	ea	1	\$1,000	\$1,200
Exc, unclassified	cy	715,000	\$0.33	\$0.39
for struct sch no. 1	cy	260	2.00	2.00
for struct sch no. 2	cy	630	2.00	3.00
Borrow	cy	30,000	0.28	0.30
Selected borrow, class B	cy	85,600	0.50	0.40
Haul	yd mi	117,000	0.22	0.20
Watering embankments	M gal	22,500	2.00	3.00
base & surf courses	M gal	11,000	2.00	3.50
Rolling power roller	day	86	45.00	45.00
pneumatic tire roller	day	1,200	44.00	40.00
Mechanical tamping	cy	3,500	2.00	1.50
Small ditches	lf	1,100	0.10	0.25
Oblit of old rds, cls 1	stay	96	10.00	12.00
Recondition rdbed, cls. B	mi	0.174	500.00	800.00
Course grav surf, ¾"	t	108,000	1.75	1.75
Asph rd mat, prime RC-1	bbl	1,560	7.50	7.50
type B surf tr MC-1	bbl	1,020	7.50	7.50
type B surf tr MC-5	bbl	1,020	8.50	7.50
Cover coat mat, cls 5 type B surf tr	t	2,490	3.00	4.50
Pen asph rd mat—pl mix	bbl	6,600	7.00	7.00
Plantmix bit surf, cls B	t	23,440	4.50	5.00
Asph rd mat, RC-5 for seal	bbl	1,420	8.00	7.50
Cover coat mat, cls 2	t	3,000	4.00	6.00
Cr grav—shoulders ¾"	t	16,000	1.75	2.05
Concrete, cls A	cy	283	60.00	75.00
Metal reinf	lb	41,000	0.15	0.15
Furn pile driving equip	ls	1	800.00	\$1,000
Timber piles, treat—furn	lf	1,960	1.50	\$2.00
drive	lf	1,840	1.50	1.25
Drive timber test piles	lf	120	3.50	5.00
Pipe culverts, 12"	lf	960	2.00	3.50
18"	lf	190	3.00	5.00
24"	lf	2,860	4.50	7.00
30"	lf	520	6.50	8.00
36"	lf	590	9.00	12.00
42"	lf	230	11.25	14.00
48"	lf	460	15.00	17.00
Corr met pipe, 18"	lf	82	1.00	2.00
Guide posts	ea	120	10.00	12.00
Steel gates	ea	2	50.00	50.00
Tunnel liner underpass	lf	90	67.25	70.00
Grav surf, 1½" to 3" max	cy	10	3.00	5.00
Gravel blanket	cy	3,550	0.80	1.80
Wire fence, type 2-A	lf	10,100	0.35	0.21

Grading and paving Vermont highway

Closing the final gravel gap on Rt. 12, the main artery between central and northern Vermont, a 5.7 mile project near Glover requires a stabilized gravel base course of cutback asphalt with sand seal. Grading, drainage, and a multi-plate arch are part of the work. The channel excavation is high for a project of this type due to the relocation of a small stream, thus eliminating the necessity of constructing four multi-plate arch culverts.

Paul H. Gates is the commissioner of highways; Bernard C. Foster, the resident engineer.

Minimum wage rates to be paid per hour are: skilled labor, \$1.35; semiskilled, \$1.10; and common, \$0.85. Minimum rates for trucks, not including the drivers, per cy per hr are \$0.60 for equipment loaded and \$0.50 for hand loaded.

Work began in May and was estimated to be completed in August, 1953.

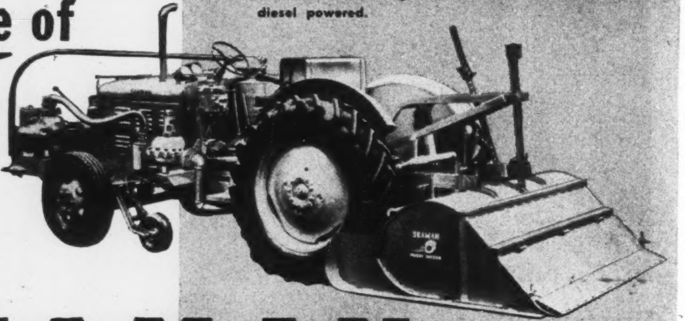
Bidders include:

1C	A. L. Dougherty Co, Hardwick, Vt	\$388,138
2	George and Vredenburgh, Montpelier, Vt	400,888
4	S. V. Rossi Const. Co, Torrington, Conn	505,232

Bids: 4-25-52 Items	Unit	Quantity	Unit Prices 1 C	 2
Excavation, common	cy	183,000	\$0.62	\$0.55
solid rock	cy	6,000	3.00	2.50
Borrow	cy	12,000	0.62	0.60
Trench excavation, earth	cy	6,270	1.60	1.50
rock	cy	600	4.00	4.00
Clearing & grubbing	ac	22	450.00	700.00
Fine grading—subgrade	sy	136,000	0.07	0.06
Exc modified, channel	cy	12,580	0.62	1.00
structure	cy	450	3.00	6.00
Roadway patrol maint	day	30	45.00	50.00

Continued on following page

Why every type of stabilized base is stronger when mixed with the SEAMAN



The SEAMAN Self-Propelled PULVI-MIXER. 7 ft. mixing width. Gas or diesel powered.

There's a very good reason why SEAMAN-mixed bases carry heavier traffic loads — and carry them longer with less maintenance. For example, take any stabilization which employs gravel. Trucking gravel to the job and especially the subsequent blading causes "segregation," — in other words, the fines sift through to the bottom — which creates an inherently unstable condition.

The SEAMAN PULVI-MIXER completely corrects segregation by *blending* and proportioning the coarse and fines equally throughout the full depth of the treatment — and at the same time thoroughly mixes-in whatever type of binder is employed. All voids are filled with the fines so that after compaction the finished stabilization is uniform and of exceptionally high density.

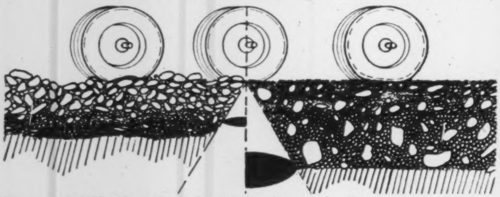
And if the material has previously been shaped to grade and finished crown the SEAMAN leaves the mix ready for immediate compaction.

This basic mixing action of the SEAMAN builds a stronger, denser, more weather resistant base with every material — from soil or sand to pit-run gravel.

Put a SEAMAN to work on your job — now. And for ever after, you'll do *all* your mixing with the SEAMAN.

(Below) In SEAMAN-stabilized aggregate base all stones are securely locked and anchored — a basic requirement regardless of binder.

(Above) Sand-clay stabilization is stronger, more economical with the SEAMAN MIXER.



The unstabilized aggregate (left above) tends to move to the surface, the fines to the bottom. Thus the material becomes loose and rough under traffic regardless of binders that may be employed unless mixed-in with the SEAMAN.

The SEAMAN stabilized aggregates (right above) form a firmly knit base essential for high load-bearing characteristics. Naturally, binders mixed-in with the SEAMAN further improve the quality.

SEAMAN MOTORS, INC.

281 N. 25th ST. MILWAUKEE 3, WISCONSIN

Vermont highway

Continued from preceding page

Bids. 4-25-52 Items	Unit	Quantity	Unit Prices 1 C	2
Maint of traffic	ls	1	100 00	500.00
Cut & remov trees	ea	50	30.00	40.00
Dust control modified	m/gal	60	4.00	5.00
Muck excavation	cy	12,500	0.62	0.30
Sub-base, gravel	cy	58,500	1.20	1.25
cr. gr modified	cy	6,500	2.50	4.00
Gravel backfill	cy	350	1.60	2.00
Strip gravel pits	cy	18,000	0.35	0.25
Stab grvl base crse of CB asph W/sand seal	gal	99,650	0.27	0.25
Concrete class B	cy	36	50.00	60.00
Reinforcing steel	lb	850	0.12	0.15
Cement rubble masonry	cy	255	30.00	40.00
R.C.—pipe 12"	lf	40	2.70	3.00
15"	lf	40	3.30	3.75
18"	lf	1,120	3.75	4.25
24"	lf	540	6.25	6.50
30"	lf	144	9.50	9.00
Asph ctd corr galv met pipe				
18"	lf	960	3.75	4.25
24"	lf	380	5.25	6.50
30"	lf	56	7.25	8.00
36"	lf	84	10.75	12.00
Vit clay pipe 6"	lf	80	1.00	2.00
Relaying pipe culverts	lf	500	2.00	2.00
Corr galv met pipe arch				
43" x 27"	ls	1	$1,000	$1,127
72" x 44"	ls	1	2,200	2,650
18' x 9' x 3½"	ls	1	4,500	6,272
Temporary bridge	ls	1	$2,500	$500.00
Remov present superstr	ls	1	$250.00	500.00
Stone fill slope protect	cy	610	4.00	2.00
Riprap bank protect	cy	10	15.00	10.00
Perf bit fibre dr pipe, 4"	lf	6,000	1.30	1.75
Precast R.C. pipe drop inlet	ea	7	100.00	200.00
Plank guard rail	lf	400	1.75	3.00
Two cable guard rail	lf	11,072	1.30	1.65
anchors	ea	44	28.00	30.00
Wood guide posts	ea	800	5.25	8.00
Removal & disposal of present guard rail	lf	1,046	0.25	0.20
Erect project markers	ea	2	25.00	30.00
Boundary markers	ea	150	7.50	9.00
Seeding modified	lf	2,200	0.10	0.50
Mulch	sy	116,000	0.04	0.05

Highway project, Va.

At a cost of $271,273 per mile, a Virginia state highway project on Rt. 60 in Alleghenv County is being constructed with a 2-in. bituminous penetration macadam top course. It has an 8-in. waterbound macadam base. Work also includes a steel bridge with two 42-ft beam spans, one 118-ft and one 89-ft truss span.

F. M. Yellott, of Lexington, is the engineer in charge of construction.

Skilled labor rates per hour range from $2.125 to $2.375; semi-skilled, from $1.625 to $1.875; and common, $0.90 to $1.10.

Work began in June and must be complete by April, 1953. Bidders include:

1C	Robertson-Henry Co. Inc., Huntington, W. Va. and Robertson, Bolen & Fowler, Inc., Buchanan, Va.	$443,408
2	Ralph E. Mills. Co. Inc., Salem, Va.	483,140
4	R. B. Gay Co., Roanoke, Va.	625,490

Bids: 5-13-52 Items	Unit	Quantity	Unit Prices 1 C	2
Clearing and grubbing	ac	14	$450.00	$400.00
Exc, regular	cy	147,954	1.00	1.12
borrow	cy	101,680	0.90	1.12
Concrete, cls C	cy	4	55.00	75.00
ret walls, cls C	cy	51	110.00	100.00
cls A	cy	1	60.00	100.00
Underdrains, UD-1	lf	242	2.50	2.50
subgr CD1 or CD2	lf	100	2.00	1.50
Pipe, 12"	lf	9	2.50	2.00
15"	lf	606	3.00	2.25
18"	lf	700	4.00	3.25
36"	lf	60	10.00	9.00
Pipe, ext, 15"	lf	315	3.00	2.75
18"	lf	705	4.00	3.75
24"	lf	327	5.00	5.50
Cast iron pipe, 3"	lf	51	2.00	1.00
Median drop inlets, DI-6A	ea	11	200.00	200.00
DI-6B	ea	4	225.00	200.00
Spring cover, spec des.	ea	1	750.00	750.00
Rd edge delineators, ED-1	ea	28	5.00	4.00
Grouted rip rap	sy	859	8.00	12.00
Std met plate grd rail	lf	4,137	5.50	5.50
R/W monuments	ea	4	5.00	10.00
reset	ea	27	5.00	5.00

Bids: 5-13-52 Items	Unit	Quantity	Unit Price 1C	2
F.A. project markers	ea	2	15.00	10.00
Topsoil, salv & stock	cy	700	0.60	0.50
W.B. mac bit pen top, 10"	sy	24,801	2.90	2.90
Stab base-type 1 or 2, 10"	sy	2,219	2.70	2.60
3"	sy	1,032	1.25	1.25
Bituminous material	gal	20,573	0.16	0.16
Cover material, no. 9	t	1,081	5.25	5.25
no. 12	t	405	5.25	5.25
no. 11	t	14	5.25	5.25
New structural steel, comp.	ls	1	$6,995	$6,995
Erect old struct steel	ls	1	5,430	5,430
Reinf steel	lb	21,915	$0.15	$0.14
Concrete, class A	cy	276	90.00	84.50
Lumber, treated	ls	1	$5,250	$5,250
untreated	ls	1	875	875
Timber piles, treated	lf	175	$8.00	$5.00
Exc, class A	cy	100	10.00	3.00
Class B	cy	187	35.00	45.00

Highway relocation, Conn.

Bituminous macadam pavement took the contract for the relocation of Route 89, a project by the Connecticut State Highway Department. The low bid for surface treated processed gravel pavement, the alternate, was 4% higher than the low for bituminous macadam.

Work consists of 7,100 lineal feet of 2½-in bituminous macadam on 6-in rolled gravel base and the construction of a twin 12-ft by 18-ft reinforced concrete box culvert over the Fenton River.

Minimum wage rates per hour for this project are bricklayer, cement finisher, stone mason, and stone cutter, $2.75; carpenter, $2.255; master mechanic, $2.30; steel worker, $3.00; oiler, $1.45; truck drivers, $1.375 to $1.485; equipment operators, $1.40 to $2.47; and common labor, $1.475.

Work begun in June and must be complete in 195 calendar days with liquidated damages set at $50 per day.

Bidders include:

		Bituminous Macadam	Processed Gravel
1C	Fred Onuparik, New London, Conn.	$298,481	$311,477
2	Cooke-Ross Inc, Torrington, Conn.	303,143	309,897
3	Enfield Road Constr. Co. Inc., Thomasonville, Conn.	316,428	322,128

Bids: 4-14-52 Items	Unit	Quantity	Unit prices 1 C	2
Clear & grub	ls	1	$6,800	$14,000
Exc, earth	cy	29,187	$0.40	$0.45
rock	cy	7,424	2.80	2.00
bridge	cy	3,100	2.25	2.35
trench 0'-6'	cy	940	1.50	1.50
Rock in trench exc 0'-6'	cy	280	5.00	8.00
Exc, trench 0'-10'	cy	40	3.00	1.75
Rock in trench exc 0'-10'	cy	40	7.00	8.00
Exc, Ditch	cy	70	2.00	2.00
Rock, slope protection	cy	9,400	2.80	2.00
Borrow	cy	169,160	0.40	0.42
Reinf conc pipe, 15"	lf	348	2.50	2.50
18"	lf	160	3.25	3.15
24"	lf	180	4.25	4.25
36"	lf	80	10.00	9.50
ACCM pipe, 15"	lf	34	2.75	3.50
U'drain, 6" perf ACCM pipe	lf	670	2.60	2.50
fndn	lf	1,070	2.60	2.50
outlets	lf	80	1.50	1.50
15" perf ACCM pipe	lf	426	5.50	4.00
Catch basin, type C	ea	8	200.00	200.00
Pile loading test	ea	2	500.00	500.00
Timber piles, 35' furn.	lf	10,710	0.55	0.55
driving	lf	10,710	0.60	0.70
Portland cement	bbl	2,776	4.25	4.50
natural cement	bbl	495	4.25	4.50
Concrete, class A	cy	1,938	27.30	28.00
for steps & copings	cy	3	60.00	75.00
Prem bit jt fil, 1/2", bridges	sf	1,340	0.75	0.75
Deformed stl bars	lb	241,330	0.03	0.03¼
Damp proofing	sf	1,400	0.75	0.75
Gravel fill	cy	90	3.00	2.00
Pervious material	cy	5,550	0.65	0.80
Formation of subgrade	cy	18,410	0.20	0.10
Roll bank grav surf	sf	270	2.00	2.00
Bit mat'l surf treat	gal	1,310	0.25	0.20
Subbase	cy	12,270	0.60	0.80
Sand cover, bit surf treat	sy	2,620	0.10	0.08
Paved ditch	sy	150	10.00	5.00
Farm wall fence	lf	,000	1.40	0.50

Bids: 4-4-52 Items	Unit	Quantity	Unit Price 1C	2
Wire fence	lf	1,000	0.65	0.50
Barways	ea	10	30.00	20.00
Wire rope railing	lf	6,700	0.90	1.00
Anchorage, type C	ea	4	30.00	20.00
compensating type	ea	38	28.00	27.50
Single post	ea	42	5.00	6.50
Processed gravel pavement[1]	t	9,600	3.25	3.00
Bit Mat'l surf treat[1]	gal	17,750	0.18	0.20
Sand cover for bit surf treatment[1]	sy	35,500	0.10	0.06
Rolled gravel base[2]	cy	3,100	1.00	1.50
Broken stone for bit macadam pavement[2]	t	3,050	4.40	4.25
Bit mat'l for bit mac pav[2]	gal	56,190	0.15	0.18

[1] Alternate to [2]

Overcrossing, Wash.

One of 51 structures included in the $66 million Washington State Highway program, the overcrossing of primary state highway No. 1 near Marysville entails special pile construction. The surface of the ground is underlaid with 1-ft to 14-ft of waterlogged peat, below which is silt. Composite piles consist of 85-ft timber with 16-ft cast-in-place concrete pile on top.

Work is under the general engineering supervision of D. D. Forgey.

Minimum hourly wages for carpenters are $2.42; piledriver engineer, $2.57; heavy equipment operators, $2.25 to $3.10; truck drivers, $2.00 to $2.55; cement handler, $2.25; concrete crewmen, $2.00; piledriver man, $2.47; and general laborer, $2.00.

Bidders include:

1C	Guy F. Atkinson Co, Seattle, Wash.	$607,606
2	S. S. Mullen, Inc., Seattle, Wash.	608,160
5	N. Fiorito Co., Seattle, Wash.	720,726

Bids: 12-11-51 Items	Unit	Quantity	Unit Prices 1 C	2
Exc, structure	cy	120	$3.50	$3.00
unsuit mater, incl haul	cy	10,660	0.90	1.50
Com borrow, incl haul	cy	9,660	1.00	1.00
Galv iron water pipe, 1"	lf	264	1.00	1.00
remov & relay	lf	420	0.80	1.50
Bridge				
Exc, structure	cy	2,300	2.00	5.00
Shoring and cribs	ls	1	$35,000	$40,000
Mechanical tamper	days	22	$70.00	$50.00
Concrete, class A	cy	3,100	72.00	60.00
class B	cy	725	30.00	40.00
class D	cy	510	26.00	40.00
Reinf conc bridge railing	lf	1,240	7.00	9.00
Steel reinf bars	lb	1,070,000	0.12	0.105
Structural carbon steel	lb	11,600	0.40	0.30
Bridge drains	ea	12	65.00	60.00
Precast conc pile exten-furn	lf	10,912	4.30	5.50
Timber piling, untreat-furn.	lf	58,000	0.70	1.00
Driving composite piles	ea	682	80.00	65.00
Furn & drive untreated timber test piles	ea	4	850.00	800.00

Test drilling, West Virginia

Unit prices shown here are for subsurface investigations for roadway design and bridge foundation construction for the West Virginia Turnpike. Type A borings are to secure ordinary dry samples; type B to secure both ordinary and undisturbed dry samples.

Bidders include:

LB	Cunningham Core Drilling & Grouting Corp, Salem, Va.	$25,350
HB	Mott Core Drilling Co. Inc., Huntington, W. Va.	26,795

Bids: 7-22-52 Items	Unit	Quantity	Unit prices LB	4B
Type A borings	lf	600	$6.00	$8.25
Type B borings	lf	50	8.00	9.00
Auger borings	lf	2,600	3.00	2.50
Core borings	lf	1,800	7.50	8.25
Undisturbed samples	ea	1	50.00	45.00

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Dual asphalt and concrete highway, Delaware

The Dover by-pass on U. S. 13 consists of 4.47 miles of dual highway with four 12-ft lanes separated by a variable width parkway. Work included a reinforced concrete bridge over the Saint Jones River. Four channelized intersections were part of the project.

Hourly rates for labor were: supervisory, $2.00 to $2.50; skilled, $1.75 to $2.50; semi-skilled, $1.25 to $2.00; and common $1.00 to $1.25.

The work was started in December, 1950 and completed March 31, 1952.

Bidders include:

1C	George and Lynch, Wilmington, Del	$1,198,170
2	James Julian, Eslmere, Wilmington, Del	1,202,906
4	Standard Bitulithic Co., Newark, N. J	1,317,704

Bids: 11-1-50 Items	Unit	Quantity	Unit Prices 1 C	 2
Clearing	ac	4.8	$800	$1,000
Grubbing	ac	1.8	600	1,000
Excavation	cy	112,000	$0.60	$0.79
Exc for structurers	cy	815	5.00	5.00
Borrow	cy	28,000	0.68	0.80
Borrow pit stripping	cy	5,000	0.30	0.35
Selected borrow	cy	54,000	1.03	1.23
Waterbound macadam	t	1,350	5.75	6.25
Hot-mix asphalt surface	t	660	12.00	18.00
Cmt conc pavement	cy	30,000	16.00	17.10
Patching	sy	200	8.00	9.50
Cement conc masonry	cy	172	75.00	80.00
footings	cy	201	61.50	65.00
abut & pier wall	cy	460	72.00	70.00
superstr & railing	cy	970	84.00	90.00
Waterproofing—super	sy	940	1.00	1.00
Reinforcing steel	lb	369,476	.14	.145
Wire mesh reinforcement	sq	10,070	5.00	5.35
Structural steel	lb	2,940	.25	.30
R. C. pipe, 12"	lf	400	2.50	2.90
15"	lf	2,900	2.75	3.45
18"	lf	4,700	3.50	3.45
24"	lf	510	5.00	4.80
30"	lf	30	8.00	9.50
Corr metal pipe, 8"	lf	360	1.50	2.00
Vit clay pipe, 6"	lf	250	1.25	1.50
Sheet piles	Mft	6.9	$275	$285
Cement conc gutter, type 1	sy	250	$4.00	$3.80
type 2	sy	100	4.00	4.25
Parkway curb, type 1	lf	2,670	2.50	3.00
type 2	lf	1,950	2.50	3.00
Cmt conc sidewalk, 4"	sf	200	0.40	0.45
Wood Shoulder curb	lf	1,650	0.60	0.65
Catch basins, type P.W	ea	7	$100	95.00
type P.W. 1	ea	24	$100	95.00
type P.W. 2	ea	3	$200	$210
type B	ea	37	$200	$200
Manholes	ea	6	$210	$200
Castings	lb	27,000	0.13	0.14
Wire rope guard fence	lf	1,650	2.20	2.00
End post attachments	ea	10	35.00	50.00
Topsoil	sy	103,000	0.25	0.28
Seeding	ac	21.5	$350	$450
Sodding	sy	16,800	$0.50	$0.65
R.C. 1 asphalt	gal	18,650	0.13	0.13
R.C. 3	gal	18,650	0.13	0.13
Slag Chips	t	520	5.50	5.50
Crushed chips	t	520	5.50	5.50
Pit run material	cy	36,000	1.02	1.11
Rem present pavement	sy	10,850	0.60	0.95
Junction boxes	ea	4	$150	$160

Bids. 11-1-50 Items	Unit	Quantity	Unit Prices 1 C	 2
Adjusted catch basins	ea	6	$25.00	$25.00
manhole	ea	1	25.00	25.00
Ditching	lf	350	1.00	1.25
Steel castings	lb	24,300	.45	.50
Iron castings	lb	640	1.25	1.50
Cast in place C.C. piles	lf	9,500	9.00	12.25
Concrete test piles	lf	140	25.00	30.00
Much excavation	ls	1	$9,000	$10,000
Pylons	ls	1	$4,100	$5,000
Lighting system	ls	1	$11,000	$8,000
Bags extra cement	ea	50	$1.00	$1.00
Flake calcium chloride	t	10	60.00	60.00

Highway grading, Nebr.

Nine miles of Nebraska State Highway, (U. S. Rt. 183), between Sargent and Taylor in Custer and Loup Counties was let in two parts. Eleven contractors went after the grading and sand gravel surfacing, and nine, the culverts. The low bidders took the contract on both. The second two low bids for the culvert work were identical.

Minimum hourly wages to be paid skilled labor are $1.05, except carpenters, crane, dragline and power shovel operators, $1.25; semi-skilled $0.95; and unskilled, $0.75. The minimum rate for horses used for the work will be $0.10 per hour.

These unit prices show the rental rate per hour for grading and shaping equipment to be used in the construction of a detour to facilitate the grading and culvert work on U. S. 183. The grading began June 2, 1952 and must be complete in 80 working days; culvert work began May 12, 1952 and must be complete in 100 working days. Liquidated damages are set at $25 per day for both jobs.

Bidders include:

Grading

1C	Theisen Brothers, Osmond, Nebr.	$111,793
2	Francis R. Orshek Const. Co., Fremont, Nebr.	114,513
11	Mosbarger & Ems Const. Co., Arapahoe, Nebr.	147,745

Bids: 3-20-52 Items	Unit	Quantity	Unit Prices 1 C	 2
Clearing & grubbing	ls	1	$1,531	$1,531
Excavation	cy	597,000	$0.17	$0.175
Water applied	M gal	10,710	0.20	Free
Topsoil or sand clay				
blanket course	cy	6,115	0.21	0.35
haul	mi cy	5,840	0.25	0.30

Bids: 3-20-52 Items	Unit	Quantity	Unit Prices 1 C	 2
Removal, conc pavement	sy	154	1.25	1.50
conc curb	lf	12	0.50	2.00
conc walks	sf	1,926	0.08	0.20
old structures	ea	2	15.00	50.00
old structures	ea	2	15.00	25.00
Motor grader, fully operated*	hr	50	8.50	9.00
Crawler tractor & scraper,				
fully operated*	hr	20	12.50	15.00
Sand gravel, class A*	cy	1,107	1.80	2.00
Exc, culverts*	cy	30	1.50	2.00
Corr metal pipe, 36" *	lf	80	9.50	10.00

* Work for detour

Culverts

1C	Nichols Const. Co., Geneva, Nebr	$84,308
2	Booth & Olson Inc., Sioux City, Iowa	86,394
2	Missouri Valley Constr. Co., Omaha	86,394
9	Diamond Engineering Co., Grand Island, Nebr.	103,794

Bids: 3-20-52 Items				
Exc, culverts	cy	3,215	$1.75	$1.50
inlets	cy	20	3.00	2.00
Conc, cls 47A-S, 47-B, or				
47C-S	cy	652.8	42.00	42.50
inlets	cy	3.2	75.00	70.00
Reinf. steel	lb	58,601	0.125	0.14
inlets	lb	70	0.125	0.14
Conc, gutter	sy	484	4.00	4.95
Conc, curb & gutter	lf	3,132	2.25	2.50
sidewalk	sf	516	0.32	0.40
crosswalk	sf	708	0.42	0.55
Cast iron covers	lb	268	0.25	0.25
Conc protection work	sy	275	5.50	6.00
Treated bridge timber	Mfbm	9.6	400.00	450.00
Adjust manhole to gravel	ea	3	20.00	25.00
CM pipe arch culv, 22"x13"	lf	88	4.00	3.75
29"x18"	lf	72	5.00	4.85
CM pipe, 48"	lf	120	13.00	13.25
60"	lf	258	21.50	22.50
72"	lf	168	26.00	27.00
CM pipe arch, drives, 22"x13"	lf	20	4.00	3.60
43"x27"	lf	20	9.00	9.70
58"x36"	lf	40	12.50	13.25
Removal, old structure	ea	6	75.00	25.00
old structures	ea	1	50.00	25.00
old structures	ea	1	50.00	5.00
old structures	ea	2	50.00	20.00
old structures	ea	3	75.00	35.00
old headwalls, pipe	ea	6	20.00	20.00
CM pipe, 18"	lf	264	3.80	3.50
24"	lf	1,323	4.75	4.55
30"	lf	280	5.70	5.75
36"	lf	243	9.20	9.30
48"	lf	216	12.50	13.25
Corr metal, drives, 18"	lf	160	3.70	3.35
24"	lf	40	4.50	4.40
36"	lf	20	8.75	9.00

Highway project, N. D.

A 18.3-mile North Dakota highway project between Hanover and New Salem brought close bidding. The low of the eleven bidders was only 1% below the second bidder and 11% below the high bid.

Asphaltic concrete surface will be used on a pit run gravel base.

Minimum hourly wages to be paid skilled labor range from $1.10 to $2.40; semi-skilled labor, $0.90 to $1.85; and unskilled, $0.75 to $1.25.

Harris Robinson, of Bismarck, is the division engineer for the North Dakota State Highway Department.

Work began in July and will be complete this year. Bidders include:

1C	W. H. Noel Co., Jamestown, N. D.	$375,168
2	S. Birch & Sons Const. Co., Great Falls, Mont	379,709
11	The Haggort Const. Co., Fargo, N. D.	422,794

Bids: 6-6-52 Items	Unit	Quantity	Unit prices 1 C	 2
Water for compaction	gal	925	$2.50	$2.00
Subbase pit run gravel, cls 7	t	104,228	0.85	0.85
Stabilized base	t	42,886	1.25	1.52
Prime bitumen MC-O, 1 or 2	gal	123,672	0.15	0.15
Blotter sand	t	2,089	2.00	3.50
Comb aggregate for asph				
conc wearing course	t	31,362	3.60	3.34
Asph cmt, 120-150 or 150-200				
pen for mix & tack	gal	327,611	0.13	0.13
Seal bitumen RC-2	gal	88,584	0.17	0.16
Seal aggregate	t	2,676	4.25	4.00

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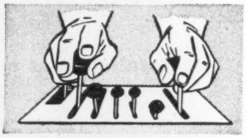

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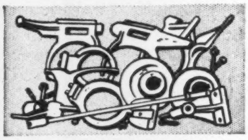

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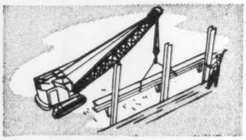

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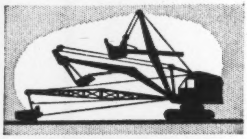

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Local materials used for Ark. highway

First stage construction of the relocation of U. S. Highway 79 between Fordyce and Kingsland, Arkansas (a gravel base course), will make use of materials from Morgan Pit, a 12.1-mi direct haul to the start of the project. Embankment material will be obtained from a pit less than one mile from the project.

Work covers seven miles and includes the construction of two multiple span reinforced concrete box culverts and two reinforced concrete deck girder bridges. Seven buildings must be removed and four reconstructed. Two gasoline pumps must be moved and reset.

Minimum hourly wage rates for skilled labor are $1.00; semi-skilled, $0.75; and common $0.75.

Bidders include:

1C	S. M. Dixon, Warren, Ark.	$411,237
2	Reynolds and Williams, Little Rock, Ark.	420,852
4	Forsgren Bros., Ft. Smith, Ark.	454,100

Bids: 5-28-52 Items	Unit	Quantity	Unit prices 1 C	 2
Clearing	ac	82	$200.00	$200.00
Grubbing	ac	79	150.00	150.00
Exc, common	cy	183,896	0.31	0.39
dry for structures	cy	757	3.00	3.00
wet for structures	cy	45	10.00	5.00
Overhaul	stay	154,328	0.02	0.01
Fence moved & reconstruct	rd	432	1.00	1.00
Reconst. bored walls	lf	40	5.00	6.00
Moving bldgs, class 2	ea	2	200.00	75.00
class 4	ea	1	400.00	300.00
class 5	ea	4	500.00	700.00
Reconst. bldg. F&A, cls 5	ea	4	100.00	75.00
Removing canopies	ea	1	300.00	500.00
Special compact, earth	cy	201,262	0.03	0.03
Embank mat'l, cls EM-13	cy	18,946	0.70	0.43
Gravel base course, cls. B-2 or B-3	cy	32,712	2.00	2.35
Conc, for bridges, cls. S.	cy	1,572	55.00	52.50
Reinforcing steel	lb	320,200	0.13	0.13
Conc piling, 16" octagonal	lf	5,150	9.50	9.25
Stl plate grd rail, 10-ga	lf	1,768	5.00	4.00
Concrete, class A	cy	511	55.00	48.00
Reinforcing steel	lb	43,649	0.13	0.13
R. C. pipe culvert, 24"	lf	708	5.00	4.90
30"	lf	260	6.00	6.70
36"	lf	68	8.00	8.00
42"	lf	140	10.00	11.00
48"	lf	152	12.50	14.00
Arch culv, SCCM, 1.5sf WW	lf	260	4.00	3.70
2.8 sf WW	lf	60	6.00	5.50
Stl plate grd fence 12-ga.	lf	228	3.50	3.50
Project marker plates	ea	2	30.00	25.00
Bridge name plates, type C	ea	2	50.00	25.00
Removing gas pumps	ea	2	100.00	100.00
Resetting gas pumps	ea	2	100.00	100 00

Kansas highway project vs. the Missouri River

When the contract for the relocation of U. S. 36 near St. Joseph, Kansas was awarded, half of the project was under five feet of the Missouri River. Work on the project was delayed until the channel was plugged by the Army Engineers and the embankment on the old location was restored so that rail and highway traffic could be resumed. Part of the embankment was done on a force account basis by James Coffey.

This relocation consists of 10 miles of grading and culverts. A 50-ft roadbed must be constructed. Three bridges and surfacing will be let at a later date.

Work is under the general supervision of Max Oelschlaeger, the resident engineer and L. H. Vincent, the division engineer.

The schedule of hourly wage rates to be paid are skilled, $1.85; semi-skilled, $1.50; and common, $1.25.

Bidders include:

1C	James Coffey, Contr., Topeka, Kan.	$277,973
2	T. F. Marbut, Emporia, Kan.	281,315
7	R. G. Aldridge, Kansas City	368,636

Grading and detour

Bids: 4-4-52 Items	Unit	Quantity	Unit Prices 1 C	 2
Large trees	ea	424	$20.00	$15.00
Grubbing hedge	lf	230	0.20	0.15
Exc, common	cy	428,000	0.22	0.24
rock	cy	24,000	1.40	1.00
class 3	cy	1,180	2.50	4.00
Compact, earthwork, type B	cy	356,519	0.03	0.04
water	M gal	1	1.75	1.75
Concrete, class A	cy	1,179	39.00	38.00
Reinforcing steel	lb	116,880	0.125	0.12
Entrance pipe, 24"	lf	1,248	4.60	4.20
24" CMP	lf	120	4.60	4.20
36" CMP	lf	40	8.00	8.00
Cross road pipe, 24"	lf	920	5.00	4.80
30"	lf	180	6.50	6.50
36"	lf	68	8.25	8.50
36" BCCMP	lf	152	9.00	9.00
Side road pipe 24"	lf	440	5.00	4.20
Reinf conc rip-rap	sy	595	5.00	5.00
Wash checks	lf	64	2.50	3.00
Combined mat'l AB-3	t	6,302	2.75	2.75
manipulation	t	6,302	1.00	1.00
Water, detour	M gal	158	3.50	3.50
Cutbk asph, MC-1 for prime	gal	4,573	0.18	0.18
RC-4 for seal	gal	3,920	0.19	0.19
Cover mat'l CM-7	cy	131	3.75	3.75
Manipulation for SAST	stay	49	9.00	10.00

Grading

Items	Unit	Quantity	Unit Prices 1 C	 2
Large trees	ea	34	20.00	15.00
Exc, common	cy	45,000	0.22	0.35
rock	cy	200	1.30	1.50
class 3	cy	113	2.50	4.00
Compact earthwork, type B	cy	41,749	0.03	0.04
Water	M gal	1	1.75	1.75
Concrete, class A	cy	103	39.00	38.00
Reinforcing steel	lb	9,300	0.125	0.12
Entrance pipe, 24"	lf	56	5.00	4.20
Cross road pipe, 24"	lf	108	5.00	4.80
Side road pipe, 24"	lf	120	5.00	4.80

Highway project, Minnesota

The Lake City-Red Wing Minnesota state highway project is the initial step in a free-way along the Mississippi from LaCrosse, Wis., to St. Paul, Minn. It consists of 13.7 miles of grading, gravel sub-base and base, and road-mixed bituminous surface. Concrete box culverts and a concrete and steel bridge are included in the work. The state is furnishing the borrow material, gravel and bituminous surface. There are eight borrow or gravel pits, 0 to 0.3 miles away from the centerline, at regular intervals along the location of the project.

This improvement of U. S. 61 must be carried on under traffic, as it is bounded by the Mississippi on one side and a very high ridge on the other that prohibit a detour system. Restricted traffic at the rate of 2,994 cars per day will be permitted.

M. J. Hoffmann is the Minnesota Commissioner of Highways; and J. C. Robbers, assistant chief engineer.

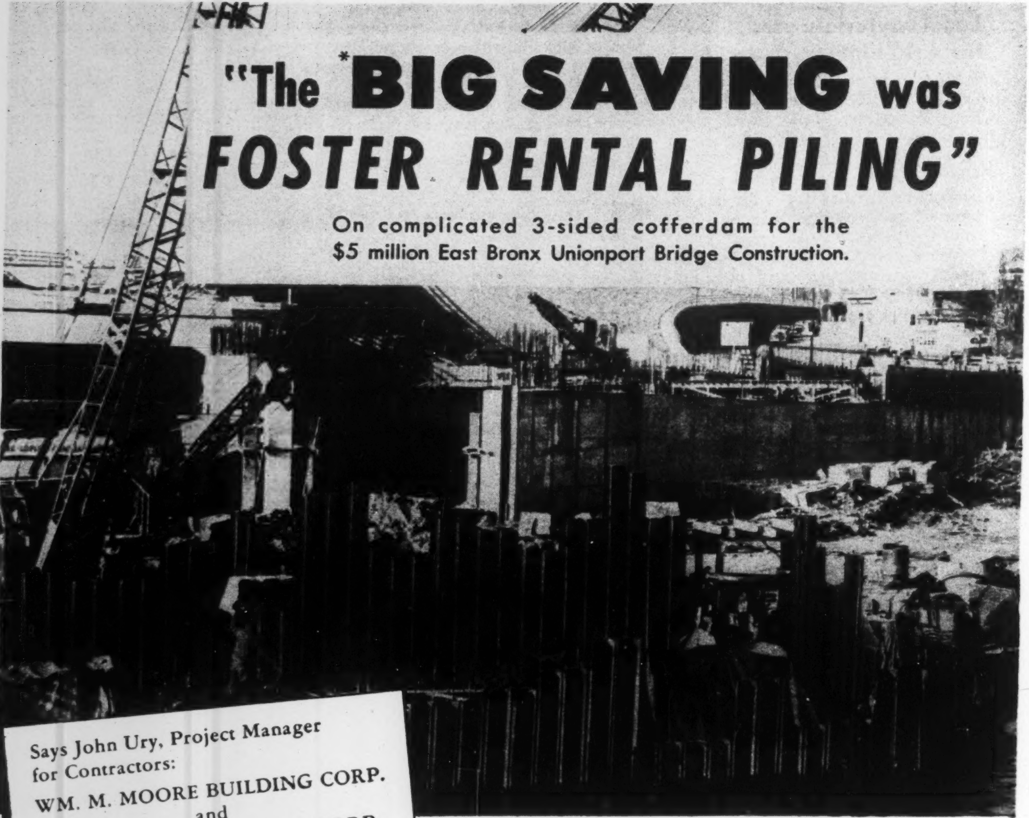
Hourly wages to be paid on the project are skilled labor, $1.60; semi-skilled, $1.20; and common, $1.10.

Work began June 1st and must be complete in 175 working days. Bidders include:

1C	A. L. Alley & Son & Fischer Const. Co., Faribault, Minn.	$1,083,232*
2	Kimmes Const. Co., Hastings, Minn.	1,101,315
6	Foley Bros., St. Paul, Minn.	1,284,053

Bids: 5-9-52 Items	Unit	Quantity	Unit Prices 1 C	 2
Clearing	ac	21	$300	$275
Clearing	ea	389	$4.00	$4.00
Grubbing	ac	18	$300	$300
trees	ea	410	$4.00	$4.00
Remove portable culverts	lf	1,440	1.00	1.00
pavement	sy	44,987	1.20	1.25
pavement for drainage	sy	658	1.20	1.50
curb integrant	lf	4,190	0.40	0.25
sidewalk	sy	80	0.50	0.50
mas & conc struct	cy	122	7.00	9.00
fence railroad R/W	lf	6,790	0 05	$.035
drop inlets	ea	1	$20.00	$15.00
Excavation class A	cy	323,594	0.31	0.30
class B	cy	11,793	1.80	1.50
borrow class A	cy	804,890	0.41	0.44
Laborers spec swamp excav	hr	663	1.80	1.75
dragline	hr	1,360	13.00	10.00
dozer	hr	2,711	8.00	10.00
3 cu yd truck	hr	405	4.00	4.25
Special ditch excav	cy	216	2.00	1.25
Obliterating old road	ac	4	$100	$100
Crib wall excav class U	cy	161	$1.00	$1.75
Metal crib walls	sf	1,587	6.00	6.50
Excavation pipe culv	cy	778	1.00	0.75
trench 0' to 6' deep	lf	926	1.30	1.50
trench 0' to 10' deep	lf	64	3.00	2.25
for M holes & C basins	cy	281	2.00	2.25
M. holes, 11, des A or F	lf	74	25.00	30.00
1, des C or G	lf	5	25.00	30.00
C basins, 4, des C or G	lf	19	25.00	26.00
6, des C	lf	18	25.00	26.00
Casting assemblies	ea	22	80.00	80.00
Hand-Placed Riprap	cy	347	10.00	10.00
Conc curb & gutter des B 624	lf	20	2.50	4.00
Permanent barricades	lf	100	5.00	4.50
Roadside seeding	ac	151	14.00	14.00
Surface mulching type 1	t	17	50.00	50.00
Area sodding	sy	11,347	0.40	0.42
Flagman	hr	3,200	1.80	1.50
C M pipe culverts, 15"	lf	888	2.90	2.75
18"	lf	942	3.50	3.25
24"	lf	100	5.20	5.20
30"	lf	24	6.10	6.25
36"	lf	202	9.50	10.20
48"	lf	162	12.50	13.70
C M P-arch culv, 18" span	lf	48	3.40	3.25
72"	lf	132	25.00	28.60
C M pipe arch culv structural plate, 107" span	lf	62	50.00	46.20
123"	lf	58	54.00	50.00
C M pipe sewers 12"	lf	34	2.40	2.50
18"	lf	64	4.10	3.40
24"	lf	114	5.70	5.30
Metal pipe flumes 18"	lf	166	3.50	3.30
Met apr CM pipes, 15"	ea	46	18.00	18.50
18"	ea	46	21.00	22.00
24"	ea	5	37.00	35.00
30"	ea	2	70.00	70.00
36"	ea	10	$106	$113
48"	ea	5	$170	$178
Met apr for C M pipe-arches 18" span	ea	2	$18.00	$20.00
72"	ea	6	$260	$260
S C pipe culverts 24"	lf	304	$5.30	$5.30
30"	lf	56	7.00	7.00
36"	lf	156	11.00	10.10
R C pipe sewers, 12"	lf	202	2.40	2.00
18"	lf	406	3.50	3.40
24"	lf	302	5.10	5.20
Conc apr for S C pipes 12"	ea	5	16.00	27.00
18"	ea	3	24.00	40.00
24"	ea	21	39.00	39.00
30"	ea	4	52.00	51.00
36"	ea	6	92.00	89.00
Concrete	cy	927	60.00	53.00
Class U excavation	cy	1,951	4.00	3.50
Sand-gravel subfndn	cy vm	678	2.50	2.50
Reinforcement bars	lb	118,060	0.16	0.15
Dbl lane by-pass	ls	1	$300	$300
Dbl lane by-pass	ls	1	$1,000	$1,000
Screen & load gravel	t	186,321	$0.25	$0.25
Sub-base constr	t	186,321	0.17	0.16
Crush, screen & load gravel	t	98,957	0.44	0.42
Base construction	t	98,957	0.16	0.17
Gravel pit stripping	cy	14,051	0.30	0.30
Gravel haul zone method	t-mi	448,788	0.15	0.17
Water	m-gal	4,705	$3.50	$4.00
Bituminous material	gal	67,200	$0.16	$0.16
Bit stab base 1" thick	sy	134,392	0.05	0.06
Bit matl for prime coat	gal	14,000	0.16	0.16
for mixture	gal	175,000	0.16	0.16
Aggregate	t	11,512	$1.10	$1.10
Bituminous surface	sy	184,187	$0.06	$0.06
Bridge				
Conc mix no. 1A6	cy	166.6	$75.00	$71.00
no. 1Y2	cy	8.6	$200	$200
no. 3Y6	cy	186	$75.00	$72.00
Exc, class DE	cy	360	5.00	3.00
Cls WE	cy	75	30.00	25.00
Reinforcement bars	lb	63,735	0.15	0.14
Wrought bronze	lb	250	2.00	2.00
Structural Steel	lb	2,945	0.60	0.75
Standard name plates	ea	2	$40.00	$30.00
Untreated timber piling deliv	lf	1,000	1.50	2.00
driven	lf	936	0.80	0.30
Treated timber piling, del.	lf	1,510	2.30	2.50
driven	lf	1,426	0.80	0.30
3 ply joint waterproofing	lf	90	2.00	2.00
Timber approach curb	ea	4	50.00	50.00

* Includes the removal of five bldgs. at lump sum prices from $50.00 to $1,500.



"The *BIG SAVING was FOSTER RENTAL PILING"

On complicated 3-sided cofferdam for the $5 million East Bronx Unionport Bridge Construction.

Says John Ury, Project Manager
for Contractors:

WM. M. MOORE BUILDING CORP.
and
LOPIER CONSTRUCTION CORP.
75 West 190th Street
Bronx, New York

Construction started in 1949, and skillful driving of 30 to 45 ft. Interlocking Steel Sheet Piling by these 2 contractors made this an economical, successful job. Unionport Bridge crosses Westchester Creek in East Bronx.

Rental Piling had to be driven considerably below the bed of the creek, with extra reinforcing to protect against swells.

An interesting installation of piers had to be constructed atop 35-year old existing caissons. Here was a tough water seepage problem in a complicated 3-sided cofferdam — approximately 1,000 gpm had to be pumped out of the cofferdam by two 6-inch pumps. Steel Sheet piling was needed — on time — in the exact section and lengths (30 to 45 feet). And Foster had it — just what the job required. A phoned order — a prompt delivery, a dependable quality — and a low cost, requiring no huge purchase investment on the part of the contractor, made FOSTER RENTAL PILING the 100% answer for this job.

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Expressway, Maryland

A $1.2-million Maryland highway project in Baltimore will complete another section of the Baltimore-Harrisburg Expressway. The contract includes 2.3 miles of grading and draining, also paving of one lane of the expressway, with connection from Shawan Road. Reinforced and plain concrete pavement will be laid on a 4-in. compacted layer of crusher run stone or slag. Macadam pavement will be used for the connection. Work also includes a triple span I-beam bridge—complete for two lanes with abutments for a future two lane.

Prevailing wage rates for Baltimore are $1.45 to $1.70 for truck drivers; $2.00 for tractor operators; and $2.85 for power crane and shovel operators.

William F. Childs, Jr. is the chief engineer for the State Roads Commission of Maryland.

Bidders include:

1C	Nello L. Teer Co., Durham, N. C.	$1,228,967
2	Central Penna. Quarry Stripping & Constr. Co., Hazleton, Pa.	1,282,854
8	Buckley and Co., Philadelphia	1,688,706

Bids: 2-19-52 Items	Unit	Quantity	Unit prices 1 C	2
Clearing & grubbing	ls	1	$12,500	$20,000
Exc, class	cy	560,000	$0.50	$0.52
class 2	cy	12,500	1.25	1.50
class 3	cy	1,150	4.50	3.00
class 4	cy	720	25.00	4.00
class 5	cy	15,000	0.85	1.50
borrow	cy	108,000	0.50	0.43
Tamped fill	cy	10,300	1.25	1.50
Trim exist ditches	lf	2,000	0.50	0.25
Rem exist masonry	cy	25	10.00	6.00
Rem & dis bldgs	ls	1	$1,000	$4,000
Rem of temp roadway	sy	3,200	$0.45	$0.12
Screen fndn layer, 2"*	sy	68,100	1.10	1.25
Cr run base crse, 6"*	sy	2,300	1.10	1.25
8"*	sy	3,200	1.45	1.60
Cr run su-base, 4"	sy	52,000	0.73	0.60
Mac base crse, 5"	sy	24,000	1.00	1.24
Shoulder drain	lf	3,200	0.50	0.60
Patch mac pave	sy	70	10.00	2.50
Stab soil base crse	t	100	4.00	3.50
Agg for cover for bit surf treated	t	90	7.00	4.50
Bit mat'l for bit surf tr.	gal	4,500	0.17	0.15
Bit mat'l for tack coat	gal	70	0.20	0.42
Pene mac surf crse, mac agg type, 3"	sy	24,000	0.75	0.80
Bit mat pene mac	gal	64,800	0.17	0.15
Bit CC sp B, 2" surf crse	t	72	20.00	13.00
RCC pave, cls P CC-9"-9"	sy	38,500	5.13	4.60
PCC pave, cls P CC-9"-9"	sy	2,400	5.00	4.50
RCC pipe, stnd reinf, 15"	lf	330	3.50	3.25
18"	lf	344	4.50	3.85
ex str reinf, 24"	lf	3,259	5.75	5.30
ex str reinf, 30"	lf	24	11.00	7.25
ex str reinf, 36"	lf	354	12.50	9.75
ACCM pipe, 15"	lf	206	4.50	4.20
18"	lf	494	5.25	4.80
24"	lf	388	7.00	6.80
36", #8 gage	lf	125	17.50	17.00
42", #8 gage	lf	134	21.50	20.00
CI pipe, heavy grd, 24"	lf	180	17.50	16.00
30"	lf	113	27.50	23.00
36"	lf	534	37.50	34.00
48"	lf	218	55.00	54.00
CI pipe, 6"	lf	120	3.50	3.00
RCC pipe, 90° bend, stnd reinf 15"	ea	10	30.00	20.00
18"	ea	1	40.00	25.00
ACCM pipe 30° bend, 15"	ea	6	30.00	18.00
18"	ea	4	35.00	22.00
CI pipe, 30° bend, 36"	ea	1	$1,000	800.00
ACCM pipe, 18"x11"	lf	468	$5.25	$5.00
22"x13"	lf	65	5.75	6.00
29"x18"	lf	50	8.50	8.00
72"x44", #8 gage	lf	52	35.00	32.00
Rem old pipe culv	lf	300	1.00	2.00
Fab struct stl bridge	ls	1	$42,500	$40,000
Concrete, cls A	cy	2,050	$42.00	$57.00
cls B	cy	165	34.50	40.00
cls C	cy	90	20.00	40.00
Reinf stl bars	lb	285,500	0.14	0.135
Selected backfill	cy	2,000	4.00	5.00
Sub-fndn drilling	lf	300	2.00	0.30
Slope protect, riprap for bridge	sy	1,900	10.00	12.00
Rock toe wall	cy	2,100	4.00	5.00
Metal railing	lf	410	12.50	14.00
Pipe connection, 18"x11"	ea	8	45.00	50.00
18"x24"	ea	1	75.00	36.00
15"x24"	ea	8	65.00	36.00
15"x24"	ea	1	125.00	62.00
Perf pipe underdr, 6"	lf	2,100	1.00	1.25
8"	lf	1,995	1.50	1.40
10"	lf	120	2.00	2.15
Pipe outlets, 8"	lf	40	1.50	1.50
Agg bkfill for underdr	cy	900	5.00	5.00
Pipe lateral, 6"x8"	ea	20	5.00	8.00
8"x10"	ea	5	10.00	9.00
Pipe elbow, 30°, 8"	ea	4	6.00	3.00
90°, 8"	ea	2	6.00	4.00
PCC gutter, cls P CC, 5"	sy	700	5.00	5.00
8"	sy	500	6.50	6.00
9"	sy	15	10.00	6.25
Conc curb, P-1, 8"x20"	lf	3,200	2.00	2.50
type A, 8"x22"	lf	2,800	2.10	2.60
Grd rail, 2 cable, stl posts 8 ft centers	lf	96	2.25	2.30
16-ft centers	lf	1,216	1.35	1.30
Grd rail, 4 cable, stl posts 16-ft centers	lf	3,264	1.50	1.50
Timber grd rail posts	ea	200	12.00	14.00
End anchorages, 2 cable	ea	8	55.00	45.00
4 cable	ea	24	55.00	55.00
Inter anchor, 2 cable	ea	4	110.00	100.00
CC pipe endwalls, P-1CC	cy	240	65.00	70.00
Inlet, type E, vert dep.	lf	20	50.00	50.00
gr & fr std	ea	4	115.00	110.00
spec H comb, gr & fr.	ea	3	200.00	200.00
spec H comb, vert dep.	lf	15	50.00	70.00
Inlet hed, special H comb	ea	3	75.00	60.00
Manhole fr & cover, type A	ea	3	55.00	50.00
Stnd manhole, vert dep.	lf	18	50.00	60.00
Inlet gr, K & ftng A	ea	21	55.00	50.00
ftng B	ea	1	65.00	51.00
J & ftng	ea	6	40.00	50.00
Main of traffic	ls	1	2,500	$3.500
T.S., furn & place	cy	1,500	$2.00	$1.00
Place stockpiled topsoil, 2"	sy	23,000	0.12	0.12
6"	sy	25,900	0.20	0.17
4"	sy	249,000	0.15	0.14
Seeding	Msy	867	6.00	8.00
Seeding & mulching	sy	202,000	0.10	0.11
Solid sodding	sy	43,000	0.50	0.42
Right of way markers	ea	120	7.00	7.00
Safety gr for 36" pipe	ls	1	50.00	40.00
48"	ls	1	55.00	45.00
Rem of exist pave	sy	2,600	0.35	0.12
Cr run base crse for main of traffic*	t	3,625	3.25	4.00

* Stone or slag

Contractor finishes project for N. H. in record time

Although the Kingston-Plaistow on New Hampshire Rt. 125 presented no exceptionally unusual problems, it was outstanding for unusual expediency in construction. The engineer reports that the contractor moved on to the job with plenty of equipment in good condition and kept it operating at maximum efficiency. As a result, the project was completed in August, about three months ahead of schedule. It consists of 3.2-mi of class C-2 road-mix, (crushed gravel).

John O. Morton is the deputy commissioner for the New Hampshire department of highways; Frederick Drew, the engineer for the project.

Wage rates per hour for the project are $1.60 to $2.80 for skilled labor; $1.25 to $2.425 for semi-skilled; and $1.15 to $1.20 for common.

Bidders include:

1C	R. G. Watkins & Son, Inc., Amesbury, Mass	$302,475
2	Thomas W. Watkins & Son, Inc., Amesbury, Mass	332,178
6	Charter Oak Const. Co., Inc., Hartford, Conn	373,930

BIDS: 2-28-52 Items	Unit	Quantity	Unit Prices 1 C	2
Clearing & grubbing	ac	20	$450.00	$450.00
Removing small trees	ea	17	25.00	25.00
large	ea	12	75.00	60.00
abandon road surface	sy	8,000	0.10	0.10
Excavation, earth	cy	99,000	0.65	0.54
ledge	cy	13,000	0.65	2.50
earth trench R	cy	3,300	1.50	1.95
ledge R	cy	200	7.00	5.00
unclass channel	cy	100	1.50	2.00
Exc uncls structure new work	cy	190	5.00	3.50
fill on existing slab	cy	25	3.00	1.00
Earth borrow	cy	79,000	0.46	0.50
Gravel overhaul	cy mi	15,000	0.10	0.10
Fine grading	sy	180,000	0.09	0.10
Gravel	cy	59,000	0.63	0.65
backfill	cy	100	2.00	2.00
Class A bit surf	gal	81,000	0.23	0.21
Class C-2 road mix pavement crushed gravel	ton	7,600	3.45	3.65
Asph cutk for C-2 pave	gal	91,000	0.15	0.18
Conc, cls A air-entrained	cy	38	41.00	50.00
cls C	cy	170	40.00	45.00
Reinforcing steel	lb	6,196	0.13	0.12
Mortar rubble masonry	cy	60	34.00	38.00
S S R C pipe, 12"	lf	228	2.25	2.80
15"	lf	1,334	2.60	3.45
18"	lf	556	3.45	4.50
24"	lf	60	5.00	6.80
48"	lf	100	15.00	15.70
60"	lf	152	27.00	26.00
R C Sewer pipe, 12"	lf	300	2.25	3.00
15"	lf	800	2.60	3.15
Paint waterproofing	sy	86	1.00	1.00
Rip rap E	cy	2	20.00	12.00
R C sewer pipe und, 12"	lf	650	3.00	3.00
Perf fiber pipe und, 4"	lf	1,700	1.40	1.10
Cob gutter cmt grout	sy	500	4.00	4.10
Cable guard rail, std GR-1A creosoted posts	lf	2,500	1.40	1.40
Multi-cable guard rail, std GR-2A creosoted posts	lf	3,600	1.90	1.90
Wood guard rail single rail std GR-3A creosoted	lf	200	3.40	3.25
Anchorages	ea	44	37.00	39.00
Post markers creosoted	ea	50	7.00	7.00
Catch basins type A	ea	3	170.00	200.00
type C	ea	10	170.00	190.00
Drop inlets type A	ea	4	150.00	200.00
type C	ea	7	150.00	185.00
Curb board	lf	3,000	0.33	0.38
Stock wire fence	lf	2,000	0.40	0.36
Project markers	ea	2	25.00	35.00
Maintenance of traffic	lf	17,049	0.07	0.07
Loam 4" deep	sy	300	0.45	0.50
6" deep	sy	3,300	0.55	0.75
Sod	sy	300	1.50	2.25
Fertilizer for grasses	lb	1,000	0.10	0.12
Grass seed	lb	80	2.00	2.00
Dust laying	ls	1,000	3.00	4.50
Bounds furn & set	ea	70	14.00	16.00
Uniformed officers	hr	350	1.50	1.65
Mulch	sy	23,000	0.08	0.09

Four steel bridges, Md.

Combined bid prices for the substructure and superstructure are reported here for three types of bridges under construction by the Baltimore Bureau of Water Supply in the Patapsco Development. J. S. Strohmeyer is the water engineer.

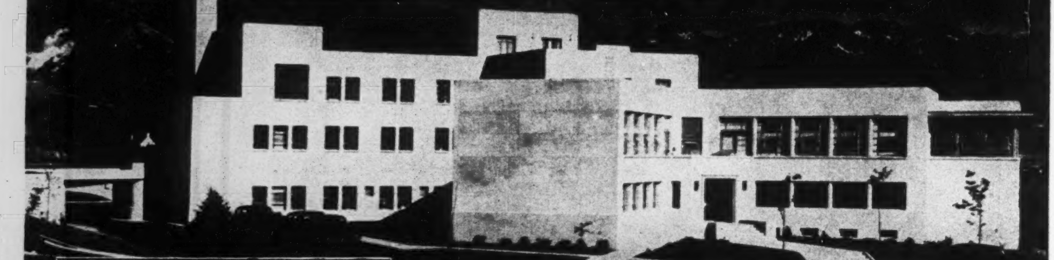
(1) The Liberty Road bridge over the Patapsco River has six 104-ft plate girder spans and one 145-ft girder span; (2) the Liberty Road bridge over Snowden Creek, seven 75-ft rolled beam spans; (3) the Ivy Mill bridge, six 90-ft rolled beam spans; and (4) the Eldersburg-Louisville bridge, two 217-ft Warren trusses and two 72-ft beam spans. The roadways are about 30 ft wide. The rolled beam and plate-girder spans have been designed for composite action under live load, wearing surface load, sidewalk and parapet load. Z-bars are welded to the top flanges to transmit shear forces between the slab and the beams. Cover plates are added to the bottom flanges of rolled beams to increase their capacity at midspan. Design live load is H-20-S-16-44.

Minimum hourly wages to be paid on the projects are: Heavy equipment operators, $1.825 to $2.60; power tool operators, $1.45; carpenters, $2.42; structural iron workers, $2.80; reinforced rod workers, $2.47; sheet metal workers, $2.50; and laborers, $1.38.

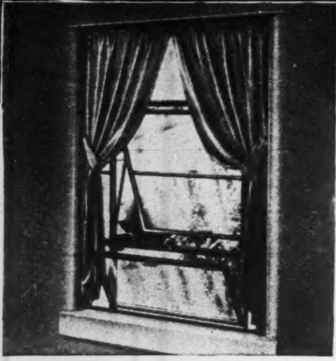
Continued on following page

Where the *other* services also count – it's always

BAYLEY WINDOWS



Shriners Hospital, Salt Lake City, Utah
Scott & Beecher, Archt., Salt Lake City
Olson Construction Co., Contr.,
Salt Lake City — Lincoln, Nebraska



Bayley Aluminum Projected Window

Offers New Features for Modern Hospitals of All Types

The *first* essential to a truly satisfactory relationship is a fine quality product. But much more is also required. Full appreciation of this fact is the bedrock of Bayley's policy — and is the reason descriminating designers from coast to coast have so highly favored Bayley for so many years.

Bayley's determination to better serve through all the building stages — from the building's inception to its occupancy — is again exemplified in the Bayley Aluminum Projected Window. It represents the culmination of years of conscientious endeavor. First to fully recognize the universal advantages of the projected window, Bayley refined its desirable features in the most enduring construction material developed through long research by the Aluminum Industry. The result is an ideal window for schools, hospitals, institutional and commercial buildings — but equally suited for private living units — that reflects Bayley's years of specialized window experience.

Regardless of window requirements, you too will find *extra values* in discussing your needs with Bayley. Write or phone.

See Bayley in Sweet's. Complete catalogs on aluminum windows, 17a/BA; steel windows, 17b/BAL; Saf-T-Gard Hospital Detention Window, 17b/BAY.

Highlights of this New Popular BAYLEY Product

— Carries Quality Approved Seal of the Aluminum Window Mfgrs. Ass'n. for materials, construction, strength of sections and air infiltration.
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— Permanent — Long carefree life.
— Simplicity — No complicated mechanism.
— Adaptable to all types of construction.
— Glazing outside — flat surface inside.
— Extra deep sections — Accommodate "Thermopane" or "Twindow" glazing.
— Easily washed from inside.
— Prepared for screens.
— Permits use of accessories, such as draperies, shades, curtains, venetian blinds or awnings.
— Positive acting hardware of white bronze.

QUALITY APPROVED

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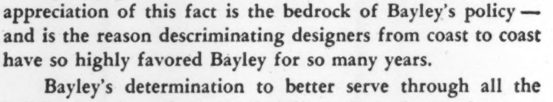
RELIABILITY



THE WILLIAM BAYLEY COMPANY
Springfield, Ohio
District Sales Offices:
Springfield Chicago 2 New York 17 Washington 16

Maryland bridges

Continued from preceding page

Liberty Road Bridge over Patapsco River

1C	Booth & Flinn Co., Pittsburg, Pa.	$1,318,925
2	Whiting-Turner Cont. Co., Baltimore	1,473,145
5	Johnson, Drake & Piper Inc., Oakland, Calif.	1,594,071

Bids: 5-7-52 Items	Unit	Quantity	Unit Prices 1 C	2
Exc, foundation, dry	cy	3,350	$5.00[1]	$14.45
wet	cy	256	10.00	14.45
Porous bkfill & underdrain	cy	70	15.00	14.50
Vitrified clay outlets	lf	30	1.00	1.60
Dampproofing	sy	150	1.00	1.25
Conc, cls H.E.S., tremie	cy	70	31.00[2]	36.45
cls A, pier footings	cy	1,630	31.00[3]	44.00
cls A, piers & abutments	cy	4,070	68.50[4]	66.75
Steel piles, furnishing	lb	244,000	0.06	0.0702
driving	lf	3,346	1.80	4.00
Reinf steel, substructure	lb	1,107,000	0.12	0.105
Low alloy stlprotect plates	lb	153,000	0.18	0.2216
Fab struct steel, girders	lb	3,063,000	0.183	0.2026
Reinf steel, substructure	lb	334,000	0.12	0.108
Conc, cls AA, deck	cy	1,370	70.00[5]	97.15
curb, sidewalk, supports & parapet	lf	3,437	12.00	17.45
Metal railing	lf	3,434	11.00	7.82
Bit wearing surface	t	620	11.00	14.70
Field office & other work	ls	1	$3,000	$6,324
maintaining	ls	1	500	1,192

Unit prices of items on separate bids

• [1] $6.00 • [2] $32.00 • [3] $32.00 • [4] $74.00 • [5] $80.00

Eldersburg-Louisville Bridge

1C	Allied Contractors, Inc., Baltimore	$345,539
2	The Empire Constr. Co., Baltimore	359,662
9	Whiting-Turner Contracting Co., Baltimore	411,112

Bids: 6-4-52 Items	Unit	Quantity	Unit Prices 1 C	2
Exc, foundation, dry	cy	730	$5.00	$6.25
Porous bkfill & underdrain	cy	41	12.00	16.10
Vitrified clay outlets	lf	130	2.00	2.05
Dampproofing	sy	92	2.00	1.25
Conc, tremie, cls H.E.S.	cy	....	.....	.....
Conc pier footings, cls A	cy	200	40.00	44.80
piers & abutments, cls A	cy	262	65.00	95.40
Steel piles, furnishing	lb	49,000	0.08	0.07
driving	lf	930	3.00[2]	3.15
Reinf steel, substructure	lb	58,000	0.11[3]	0.156
Low alloy stl protect plates	lb	10,800	0.25	0.28
Fab struct steel, beams	lb	187,000	0.196	0.1767
trusses	lb	914,000	0.20[4]	0.1877
Reinf steel, superstructure	lb	108,000	0.11	0.12
Concrete, cls AA, deck	cy	450	60.00	95.00
curb, sidewalk, supports, & parapet	lf	1,212	17.00	15.00
Metal railing	lf	1,215	9.00	10.50
Bit wearing surface	t	209	18.00	19.25
Field office & other work	ls	1	$5,000[5]	$5,300
maintaining	ls	1	1,500[6]	1,100

Unit prices of items on separate bid

• [1] $6.00 • [2] $4.00 • [3] $0.12 • [4] $0.208 • [5] $6,000 • [6] $1,800

Liberty Road Bridge over Snowden Creek

1C	McLean Contr. Co., Baltimore	$473,020
2	The Empire Const. Co., Baltimore	514,211
10	DeLuca-Davis Const. Co. Inc. & Fred D. Carozza & Co., Baltimore	594,940

Bids: 5-21-52 Items	Unit	Quantity	Unit Prices 1 C	2
Exc, foundation, dry	cy	2,500	$4.25[1]	$7.40
Porous bkfill & underdrain	cy	38	22.00	15.70
Vitrified clay outlets	lf	50	2.00	2.05
Dampproofing	sy	80	2.00	1.45
Conc, cls A, pier footings	cy	830	32.50[2]	33.00
piers & abutments	cy	1,260	54.00[3]	67.95
Steel piles, furnishing	lb	131,000	0.08[4]	0.0808
driving	lf	2,450	1.20[5]	1.87
Reinf steel, substruct	lb	271,000	0.115[6]	0.12
Low alloy stl protect plates	lb	95,000	0.25[7]	0.284
Fab struct steel, beams	lb	1,148,000	0.139[8]	0.1425
Reinf steel, superstructure	lb	190,000	0.115[9]	0.115
Conc, cls AA, deck	cy	746	60.00[10]	71.60
curb, sidewalk, supports & parapet	lf	1,968	17.50[11]	13.12
Metal railing	lf	1,966	9.00	9.00
Bit wearing surface	t	365	18.50	18.30
Field office & other work	ls	1	$7,000[12]	$6,655
maintaining	ls	1	1,500[13]	1,400
Steel pipe, 6" for oil line & incidentals	ls	1	3,300	8,832

Unit prices of items on separate bid

• [1] $4.35 • [2] $34.00 • [3] $55.00 • [4] $0.09 • [5] $1.30 • [6] $0.13 • [7] $0.28 • [8] $0.144 • [9] $0.12 • [10] $62.00 • [11] $18.00 • [12] $8,000 • [13] $1,700

Ivy Mill Bridge over Patapsco River—

1C	The Empire Constr. Co., Baltimore	$340,197
2	Piracci Const. Co. Inc., Baltimore	362,654
7	Frank Pecora Constr. Co. Inc	503,676

Bids: 6-18-52 Items	Unit	Quantity	Unit Prices 1 C	2
Exc, foundation, dry	cy	810	$6.00	$6.00
wet	cy	252	28.00	16.00
Porous bkfill & underdrain	cy	32	15.00	11.00
Vitrified clay outlets	lf	25	2.50	2.00
Dampproofing	sy	77	1.50	2.00
Conc, cls HES, tremie	cy	84	32.00	40.00
cls A, pier footings	cy	350	35.00	36.00
piers & abutments	cy	1,070	64.00	60.00
Steel piles, furnishing	lb	25,000	0.08	0.09
driving	lf	475	2.00	3.00
Reinf steel, substructure	lb	177,000	0.13	0.11
Low alloy stl protect plates	lb	54,500	0.30	0.35
Fab struct steel, beams	lb	858,000	0.1401[1]	0.18
Reinf steel, superstructure	lb	111,000	0.127	0.12
Conc, cls AA, deck	cy	427	60.00[2]	58.00
curb, sidewalk, supports & parapet	lf	1,136	18.00[3]	17.00
Metal railing	lf	1,132	9.65	9.00
Bit wearing surface	t	....	....	....
Field office & other work	ls	1	$9,600	$7,000
Maintaining	ls	1	1,000	1,800

Unit prices of items on separate bid

• [1] $0.1501 • [2] $72.80 • [3] $24.20

Bids taken three ways for Atlantic City tank piling

Steel H piles brought the low bid for the foundations of an elevated steel storage tank to be erected at Atlantic City. They were 8% below the bid for cast in place concrete piles and 20% below the bid for creosoted wood piles. The piles must be carried 60-ft through sand and silt layers to reach suitable bearing.

Pittsburgh-Des Moines Steel Company, with a bid of $157,450, was the low for the water standpine and tank. The tank has a million gallon capacity, 115-ft to overflow, with an 80-ft tower.

Malcolm Pirnie Engineering Company, of New York City, are the consultants for the city.

Unit prices are shown below for the two low bidders for the foundations with the alternate differences.

The project must be completed in 450 days. Bidders include:

LB	Arthur R. Henry Inc., Northfield, N. J.	$103,163
2	Ole Hansen & Sons Inc., Pleasantville, N. J.	109,588
4	Anthony P. Miller Inc., Atlantic City	127,463

Bids: 6-12-52 Items	Unit	Quantity	Unit 1B	Prices 2
Gen exc & backfill	cy	900	$11.00	$9.35
Steel H piles	lf	6,850	5.75	6.18
Concrete	cy	220	60.00	69.00
Reinforcing steel	lb	10,000	0.17	0.20
Fencing	lf	620	4.00	4.00
Sliding gate	ea	1	350.00	350.00
Concrete block wall	lf	260	9.50	8.00
Top soil & grassing	sy	2,500	0.60	0.50
Bituminous paving	sy	2,500	1.75	1.00
Rough grading of site	ls	1	$7,500	$11,000
First test	ea	1	2,400	2,500
Additional tests	ea	1	2,000	2,000
CI pipe & fittings	ls	1	5,500	5,300
Valves & hydrant	ls	1	5,800	8,000
Reinf conc drain, 18"	ls	1	2,200	2,000
Misc steel & iron work	ls	1	1,000	1,000
Water level indicator	ls	1	1,400	1,200
Creosoted wood piles	lf	16,500	$2.50	$2.66
First test	ea	1	$1,000	$1,200
Additional tests	ea	1	800	1,000
Conc piles, cast in place	lf	7,650	$6.00	$5.50
First test	ea	1	$2,000	$1,840
Additional tests	ea	1	1,600	1,610

Water system, S. C.

Negotiating specification changes with G. E. Moore, Inc., the low bidder on the water distribution system for the Welcome Area, the City of Greenville, S. C. reduced the contract price of the project by $5,500. Different type valves and hydrants were substituted and 2-in. cast iron pipe for 2-in. galvanized iron. The unit prices on 6, 8, 10 and 16-in. cast iron pipe were reduced by adopting a thinner cement lining than that specified. The McPherson Company, of Greenville, are the consultants.

The system will serve 1,200 acres. Work includes six railroad supply line crossings, two bridge crossings and one stream crossing. Construction began July 21 and must be complete by May, 1953. It is accessible to both rail and highway transportation.

The schedule of wage rates to be paid are: skilled, $1.75; semi-skilled, $1.10; and unskilled, $0.80.

Reduced prices are noted. Bidders include:

1C	G. E. Moore, Co., Greenwood, S. C.	$386,205*
2	C. Y. Thomason Co., Greenwood, S. C.	398,649
6	McKoy-Helgerson Co., Greenville, S. C.	464,868

Bids: 6-5-52 Items	Unit	Quantity	Unit Prices 1 C	2
Cast iron pipe, 16"	lf	7,378	$9.83a	$9.35
12"	lf	12,830	5.77	5.75
10"	lf	15,134	4.64b	4.90
8"	lf	7,210	3.72c	3.77
6"	lf	25,590	2.68d	2.85
2"	lf	33,100	1.15e	1.40
Cast iron fittings, 16"	t	5.25	340.00	500.00
6"-12"	t	13.21	350.00	480.00
Fire hydrants	ea	30.0	128.00f	135.00
1-4 1/2" S. nozzle	ea	9.0	145.00g	148.00
Valves, 16", W/MH	ea	3.0	798.00h	775.00
12" W/VB	ea	6.0	210.00i	230.00
10" W/VB	ea	9.0	160.00j	165.00
8" W/VB	ea	7.0	114.00k	110.00
6" W/VB	ea	70.0	90.00	80.00
2" W/VB	ea	70.0	40.00	30.00
Air valve	ea	1.0	275.00	150.00
Bridge crossing, W/16" CIP	ea	1.0	1,912.00	1,800.00
W/10" CIP	ea	1.0	407.00	300.00
R. R. Crossing with 18 LFRC pipe	ea	1.0	495.00	300.00
20 LFRC pipe	ea	1.0	550.00	310.00
22 LFRC pipe	ea	1.0	605.00	320.00
28 LFRC pipe	ea	1.0	770.00	400.00
48 LFRC pipe	ea	1.0	1,320.00	720.00
18 LF x STR pipe	ea	2.0	756.00	500.00
Stream crossing W/16" CIP	ea	1.0	335.00	275.00
Blow-off	ea	1.0	235.00	200.00
Rock excavation	cy	100.00	10.00	15.00

* $379,655

a, $9.60; b, $4.48; c, $3.60; d, $2.60; e, $1.13; f, $139.35; g, $155.60; h, $825.75; i, $252.20; j, $193.30; and k, $124.00

Water and sewer project for Monrovia, Liberia

The first community water and sewerage system is now under construction in Monrovia, Republic of Liberia, West Africa. Previously, local needs had been supplied by rain water cisterns, dug wells and tank trucks in limited quantities. The new systems will serve 18,000 to 20,000 people.

Work consists of an infiltration supply system, pumping station, 600,000 gallon reservoir, water mains (18,000 feet of 16-in. pipe and 70,000 feet of 4-in. to 12-in. pipe), 50,000 feet of sewers, 6-in. to 24-in., and appurtenances. Special construction for the outfall sewer includes dowels and timber bracing; for the reservoir roof, an overflow with manhole, drain,

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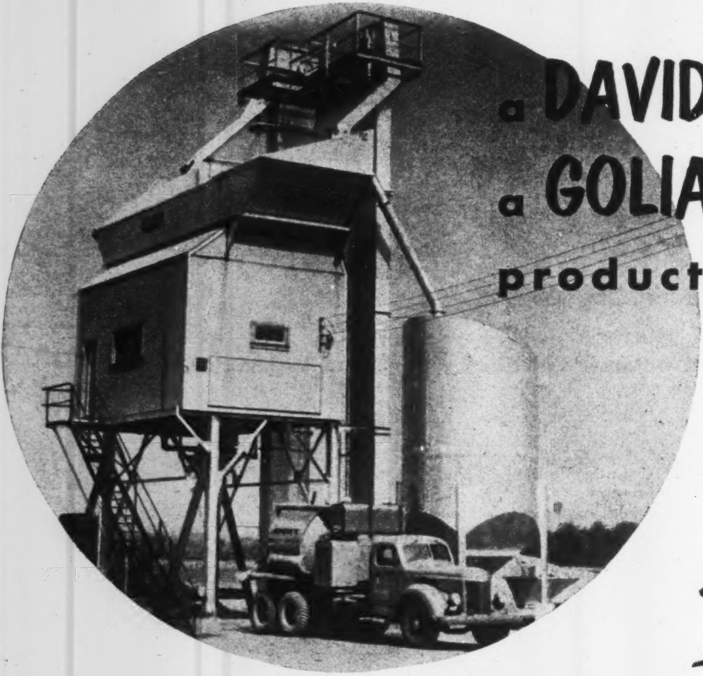

a DAVID in size... a GOLIATH in production...

Remarkable portability is the keynote of this BUTLER Ready Mixed Concrete Plant. The 85 yard 4 compartment bin ships in one piece. Legs and bracing, when knocked down, complete a load for one flat car or low-bed trailer. A second load is made up of elevator, batchers and one-piece overflow cement bin. Erection is quick and easy with a crane and 3 men.

Portability makes location at your job site practical; eliminates a large investment in costly truck-mixers. And with well co-ordinated delivery of materials either to crane, belt conveyor or elevator — production will be equal to the usual Goliath-like plant.

For the contractor meeting tight schedules in any building construction, this plant provides complete control in quality and delivery, to match his requirements. For every pour, large or small, the plant's versatility in production and the low investment required means lower cost per cubic yard and a correspondingly greater profit.

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BUTLER BIN COMPANY
BULLETIN 185
WAUKESHA, WISCONSIN

A number of portable BUTLER Ready Mixed Plants as well as many installations of BUTLER *engineered design* are shown in Butler Bulletin 185. Write for your copy today.

BUTLER BIN CO. WAUKESHA, WIS.

Liberian project

Continued from preceding page

air vent and screens, flap gate and a water level gage. A dome or flat slab roof may be used, depending upon the lumber and workmen available.

The Liberian Government is furnishing cast iron pipe, fittings, valves and hydrants. Major construction equipment is available to the contractor on a daily rental basis of $5.00 for 315 cfm air compressor, $15.00 for Tournadozer, $2.00 for 6-in. centrifugal pump. $20.00 for shovel and dragline, $8.00 for 16s concrete mixer with power loader, $5.00 for 3-ton dump truck, and $2.00 for 400-ampere welding machine.

Wages for labor range from $0.35 to $2.00 per day.

Work began in June and must be complete in August, 1953.

Hazen and Sawyer, of New York City, are consultants. The project is being financed by a loan from the Export-Import Bank.

Unit prices are shown here for the only bidder on the project, West African Constructors, Ltd., of New York City and Monrovia, who were only 4% above the engineer's estimate, with a bid of $865,565.

Items	Unit	Quantity	Unit Price
Trench excavation &backfill			
earth	cy	26,000	$2.25
rock	cy	9,000	15.00
for CI pipe, 16"	lf	18,215	0.65
General exc & backfill, earth	cy	3,000	1.70
rock	cy	600	14.00
Sand cushions & refill below grade	cy	1,300	1.60
Concrete, class A	cy	1,000	65.00
class B	cy	450	35.00
block	cy	250	25.00
Rubble masonry	cy	80	24.00
Reinforcing steel	lb	66,000	0.27
Sewer pipe, 6"	lf	1,500	1.25
8"	lf	37,700	1.60
12"	lf	7,900	2.40
24"	lf	5,500	5.80
Y-branches, 4" & 6"	ea	500	4.00
Sewer manholes, 4.5' or less	ea	300	105.00
extra for depth over 4.5'	lf	250	24.00
extra for drop manhole constr	ea	30	20.00
extra for CI frames and covers	ea	65	95.00
Cast iron sewer pipe, 6"	lf	300	1.90
8"	lf	350	2.10
12"	lf	20	4.50
16"	lf	250	8.00
Outfall sewers, special constr	ls	1	$1,650
Cast iron pipe, valves & ftngs, 4"	lf	39,000	$1.25
6"	lf	8,700	1.65
8"	lf	16,850	2.20
12"	lf	4,500	3.00
16"	lf	18,215	3.05
Fire hydrants, post type	ea	10	45.00
tropical type	ea	30	60.00
CI water main—Mesurado River Bridge	ls	1	$4,435
beneath railroad & highway	ls	1	2,640
Drilling & gouting dowel holes	lf	350	$6.00
Remove & replace existing pavements, curbs, & public walks	sy	4,000	$2.60
Clear Bushrod Island intake area	ls	1	$3,100
Bushrod Island Water collect sys			
Collector, 6"	lf	1,500	$9.40
8"	lf	1,500	10.20
10"	lf	1,500	11.30
12"	lf	1,670	12.20
14"	lf	1,670	14.20
16"	lf	1,200	15.50
Manholes	ea	19	200.00
Bushrod Island pumping station			
pumping equipment (eng. est.)	ls	1	$18,000
install	ls	1	5,300
Chlorinating equipment	ls	1	1,950
Flow meter	ls	1	1,000
Valves & piping	ls	1	6,150
Superstructure, spec constr	ls	1	3,290
Reservoir			
Roof	ls	1	7,350
Special construction	ls	1	3,600
Corporation stops & service lines to public water fountains & latrines			
Stop, ⅝"	ea	8	$4.50
¾"	ea	15	5.00
1"	ea	3	9.00
1½"	ea	2	13.00
Service saddles, 4" pipe	ea	20	14.00
6"	ea	2	18.00
Service pipe, ¾"	lf	160	1.10
1"	lf	1,000	1.50
1½"	lf	750	2.20
2"	lf	700	3.10
Public water fountains & latrines special construction	ea	24	580.00

Sewerage Shippensburg, Pa.

Five contracts for sewerage system and sewage treatment plant for the Shippensburg Borough Authority were let for $1,015,842—13% below the engineer's estimate. The sewerage system, contract 1, attracted four bidders; and the sewage plant, contract 2, excluding plumbing, heating and electrical work, attracted eight bidders. Unit prices are shown here for these two contracts and also the lump sum bids of the other three contracts.

Work includes 80,000 feet of 8, 10, 12, 15, and 18-in. vitrified clay sewer pipe, at depths of 8 to 14-ft, a 0.9 mgd high rate recirculating filter type sewage treatment plant, and two branch pumping stations.

Gannett Fleming Corddry & Carpenter, Inc., of Harrisburg, are the consultants.

Bids were taken February 19, 1952. Bidders include:

Contract 1—Sewerage system

1C	A. J. Stormer & Son, Altoona, Pa.	$666,564
2	Globe Contracting Co., Upper Darby, Pa.	789,832
4	E. D. Plummer & Sons, Chambersburg, Pa.	1,414,059

Bids: 2-19-52 Items	Unit	Quantity	Unit prices 1 C	2
Earth trench excavation				
6" service connect	cy	5,900	$3.70	$5.00
8" pipe, 0' to 8'	lf	25,600	2.30	2.50
8' to 10'	lf	28,450	2.65	3.00
10' to 12'	lf	10,200	3.20	3.75
12' to 14'	lf	2,600	4.00	4.50
14' to 16'	lf	500	5.45	7.50
16' to 20'	lf	250	7.20	16.00
20' to 24'	lf	160	8.64	20.00
10" pipe, 0' to 8'	lf	2,650	2.40	2.50
8' to 10'	lf	570	2.75	3.00
10' to 12'	lf	630	3.30	3.75
12' to 14'	lf	450	4.10	4.50
12" pipe, 0' to 8'	lf	50	2.75	2.50
8' to 10'	lf	1,160	3.20	3.00
10' to 12'	lf	500	3.38	3.75
12' to 14'	lf	250	4.40	4.50
14' to 16'	lf	200	6.15	7.50
15" pipe, 0' to 8'	lf	50	2.80	2.50
8' to 10'	lf	360	3.35	3.00
10' to 12'	lf	400	3.60	3.75
12' to 14'	lf	35	4.70	4.50
18" pipe, 0' to 8'	lf	2,700	3.27	3.50
8' to 10'	lf	350	3.42	4.00
10' to 12'	lf	550	4.55	4.25
12' to 14'	lf	930	5.70	5.50
Embankment	cy	100	2.50	3.50
Sheet & brac, lf in place	Mfbm	50	75.00	150.00
Earth exc below subgrd	cy	100	2.50	5.00
Rock trench exc	cy	11,400	9.00	14.00
Underdrain, 6"	lf	100	0.80	2.00
Service connect, 6" VCP	lf	20,800	0.90	1.05
VCP Y or T, 6"x6"x6"	ea	115	2.97	3.00
VCP, stnd str, 8"	lf	63,200	1.11	1.40
extra str, 8"	lf	3,650	1.44	1.75
VCP Y or T, 8"x8"x8"	ea	1,215	3.74	5.00
VCP, stnd str, 10"	lf	3,625	1.95	1.70
extra str, 10"	lf	625	2.10	2.35
VCP Y or T, 10"x10"x6"	ea	55	5.03	5.00
VCP, stnd str, 12"	lf	1,520	1.74	2.15
extra str, 12"	lf	575	2.57	3.15
Y or T, 12"x12"x6"	ea	20	6.16	7.00
VCP stnd str, 15"	lf	475	2.41	3.25
extra str, 15"	lf	310	3.93	4.60
Y or T, 15"x15"x6"	ea	7	11.08	14.00
VCP stnd str, 18"	lf	3,450	3.27	5.15
extra str, 18"	lf	1,025	4.63	7.00
Y or T, 18"x18"x6"	ea	17	15.34	20.00
Crushed stone cradles	cy	1,620	4.00	6.00
Conc, cls B, pipe anchors, cradles, bedding & encase	cy	32	40.00	35.00
Brick manholes, 0' to 12',				
8" walls	vf	2,350	22.00	19.00
below 12', 12" walls	vf	27	50.00	25.00
Conc, cls B, manhole bases	cy	265	35.00	25.00
CI manhole frames & covers	ea	292	27.50	50.00
Manhole steps	ea	1,924	1.10	1.20
Lampholes complete	vf	87	4.00	8.05
Drop connections, 8"	ea	12	12.50	50.00
10"	ea	1	15.00	50.00
Stubs in manholes, 8"	ea	2	4.50	10.00
10"	ea	1	6.00	10.00
12"	ea	1	8.00	10.00
18"	ea	1	12.00	20.00
Replace pavement, type 1	sy	35	8.50	9.00
type 2	sy	30	5.00	4.00
type 3	sy	15,400	3.20	3.00
type 4	sy	8,500	3.10	2.50
type 5	sy	6,200	2.90	2.00
type 6	sy	2,200	1.50	1.50
Replace conc curbs, gutters & walks	cy	10	80.00	40.00
Stream crossing, 8" CIP (2)	lf	140	10.00	35.00
8" CIP	lf	30	10.00	25.00
18" CIP	lf	50	14.00	40.00
cls B conc, pipe encase	cy	40	40.00	50.00
Allowance for lab tests	ls	1	500.00	500.00

Contract 2—Sewage treatment plant

1C	Boyd H. Kline, Bloomsburg, Pa.	$314,017
2	Brotherton Constr. Co., Harrisburg, Pa.	355,411
8	Lipsett Inc, New York City	490,020

Bids: 2-19-50 Items	Unit	Quantity	Unit prices 1 C	2
Control bldg ♯	ls	1	$67,257	$70,707
Primary clarifier*	ls	1	26,325	27,774
Secondary clarifier*	ls	1	28,528	33,809
Bio-filter*	ls	1	34,424	42,000
Sludge digester*	ls	1	40,103	38,495
Chlorine contact tank*	ls	1	2,986	5,327
Two sludge drying beds, exclusive glass enclosures	ls	1	16,682	18,800
Glass enclosure for one	ls	1	18,277	21,932
Sewage pumping station, ♯1*	ls	1	11,344	14,438
♯2*	ls	1	10,317	13,227
Brick manholes within confines of plant (but 1)	ls	1	2,407	2,485
Rds, parking area, walks, steps & drainage	ls	1	4,353	5,563
Other exc and embankment	ls	1	4,791	2,139
Outside inter-unit piping, not included elsewhere	ls	1	16,244	17,809
Fencing with gate	ls	1	4,200	4,750
CI force mains, 6"	lf	2,380	$3.80	$6.50
Asb cmt water sup line, 8"	lf	2,425	5.04	6.25
6"	lf	90	5.17	17.00
Laboratory tests	ls	1	$1,500	$1,500
equip, supplies & plant tools	ls	1	1,000	1,000
Landscaping, planting, seeding & sodding	ls	1	1,500	1,500

♯ exclusive of work in other contracts
* exclusive of electrical work

Contract 3—Plumbing

1C	Frank E. Ferraris, Shippensburg, Pa.	$2,977
2	Keystone Crate & Blower Works, Chambersburg, Pa.	3,883

Contract 4—Heating

1C	Frank E. Ferraris, Shippensburg, Pa.	$11,284
2	Humble-Mumds Co. Inc., York, Pa.	11,639

Contract 5—Electrical

1C	C. R. Kilgore & Son, Lemoyne, Pa.	$21,000
2	A. G. Crunkleton Electric Co. Inc., Greencastle, Greencastle, Pa.	27,945

Levee, Tennessee

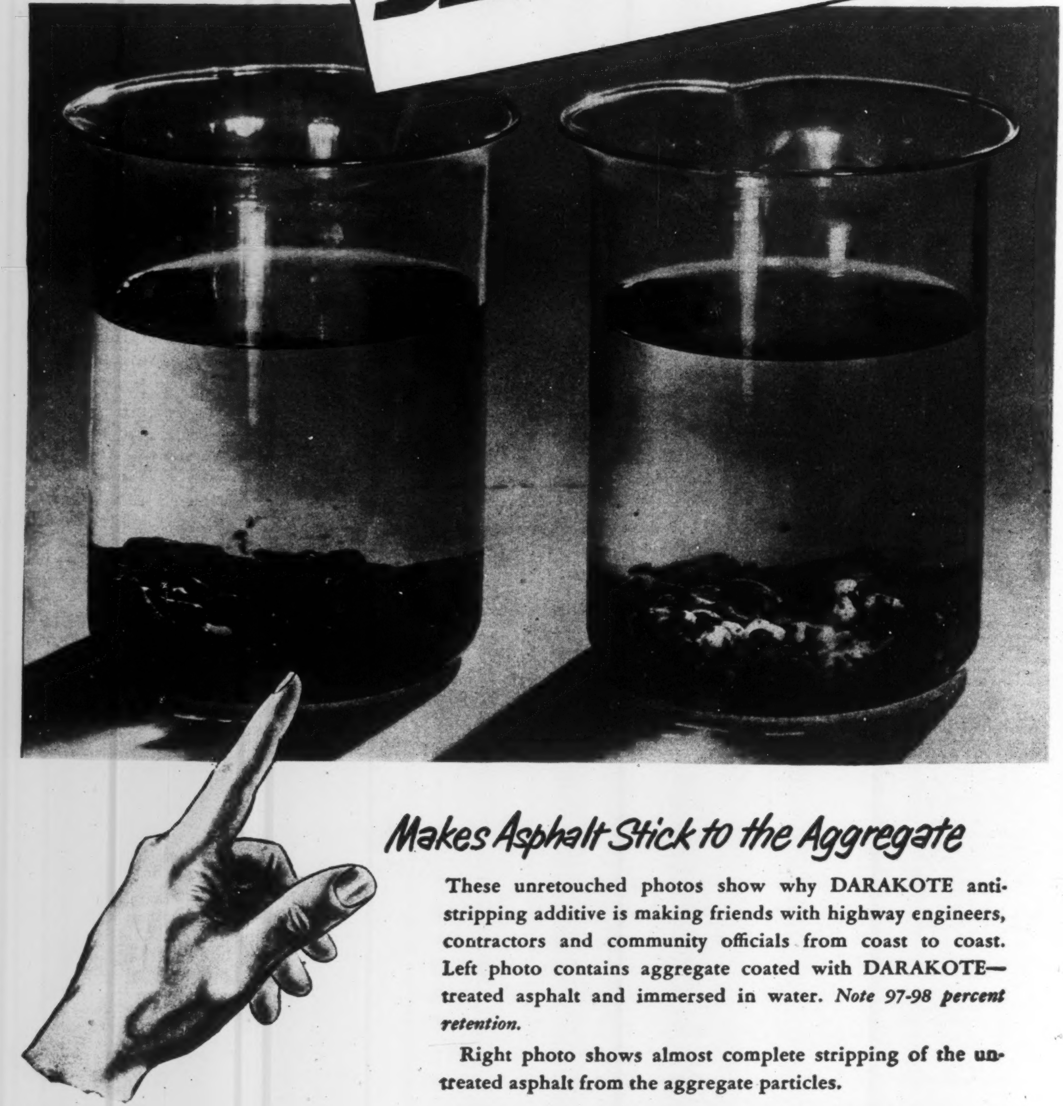
Both bids received by the Corps of Engineers, Memphis Tennessee for levee construction in Dyer County were below the engineer's estimate of $307,020. Work includes 3,079 linear feet of straddle enlargement and roadway embankment; 15,277 linear feet of new levee and roadway embankment; and 720 linear feet of spur levee enlargement.

Bidders include:

1C	Pioneer Constructing Co., Inc., Memphis	$293,400
2	Forcum-James Company, Dyersburg, Tenn.	257,250

Bids: 5-29-52 Items	Unit	Quantity	Unit prices 1 C	2
New levee, levee enlargement & roadway embankment	cy	1,050,000	$0.228	$0.245

Here's how DARAKOTE



Makes Asphalt Stick to the Aggregate

These unretouched photos show why DARAKOTE anti-stripping additive is making friends with highway engineers, contractors and community officials from coast to coast. Left photo contains aggregate coated with DARAKOTE—treated asphalt and immersed in water. *Note 97-98 percent retention.*

Right photo shows almost complete stripping of the untreated asphalt from the aggregate particles.

WRITE FOR COLORFUL, FACTUAL BROCHURE TODAY

. . . helps make paving dollars go further!

DARAKOTE is the anti-stripping additive for all types of bituminous mixtures and aggregates. Added to the asphalt mix, DARAKOTE actually displaces water on wet aggregates. It permits use of even hard-to-coat local aggregates. It *prevents* stripping both during and after construction. It extends the service life and durability of the pavement.

That means that DARAKOTE is *low-cost insurance* for you. Without question, it increases retention of stability of bituminous mixtures that are subject to adverse moisture conditions. And . . . it saves money to boot! For DARAKOTE permits wider use of local aggregates . . . enables road crews to work despite bad weather, which means more working hours on wet days—more working days in each paving season.

DARAKOTE is easy to use . . . pours readily and disperses quickly in bituminous materials. It is sold for use in the field, and in concentrated form to refineries for use in the production of treated asphalt. To *insure* the success of your next paving job, specify the use of DARAKOTE anti-stripping additive in asphalt-and-aggregate mixes.

DARAKOTE SAVES MONEY . . .
DOES A BETTER JOB
★ PREVENTS STRIPPING DUE TO MOISTURE
★ ADDS WORKING DAYS TO PAVING SEASON
★ GIVES LOW-COST ROAD 'INSURANCE'
★ PERMITS WIDER USE OF LOCAL AGGREGATES

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Penetrating type, high silicone content water repellent for waterproofing exterior masonry above grade. Actually repels water. Clear, colorless, leaves no film, dries quickly.

DARALITE
Air-entraining agent for use with lightweight aggregates in non-structural applications where high percentages of entrained air are desired.

DAREX AEA
The only *catalyzing* air-entraining agent specifically formulated for making air-entrained concrete. Highly uniform and not super-sensitive, it can be depended upon for close, error-saving control of air-entrainment in ready-mixed or job-mixed concrete.

Also air entraining agents and grinding aids for use in the manufacture of cement.

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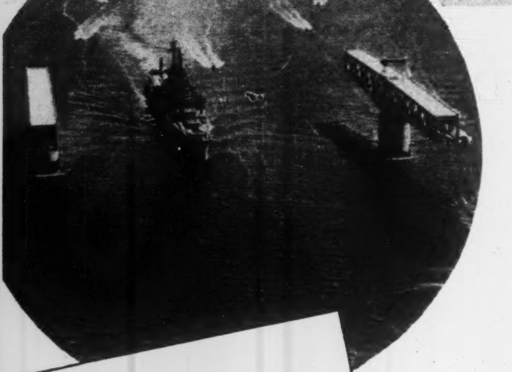
World's largest double-leaf swing type bridge fabricated and erected by AMERICAN BRIDGE



THE George P. Coleman Memorial Bridge spanning the deep, swift York River between historic Yorktown and Gloucester Point, Virginia, is another engineering and construction triumph for American Bridge.

Resting on 220-ft. concrete piers extending 60-ft. above the water, this 3,750-ft. structure with its tandem swing spans is the largest bridge of its type in the world.

The superstructure, which is a combination of cantilever arms, deck plate girders, and suspended deck truss spans, has the extraordinary distinction of having two 500-ft. swing spans, each weighing 1,300 tons! Pivoting horizontally on piers 44-ft. in diameter, these unique spans swing open 90 degrees simultaneously to provide a 450-ft. freeway for the ample passage of even the largest U. S. fighting vessels.

The swing spans fabricated in the Roanoke, Virginia shops of American Bridge were erected in the open position. So well were all the phases of the work performed that when the bridge was closed, the three connecting points fitted together perfectly—again demonstrating the dependability of American Bridge construction.

INTERESTING FACTS

Total Length of Bridge	3,750′	Weight of Each Swing Span	1,300 tons
Length of Each Swing Span	500′	Weight of Steel Superstructure	10,720,000 lbs.
Number of Shipping Pieces	5027 (178 carloads)		

Owner: State of Virginia, State Highway Dept.
Engineers: Parsons, Brinkerhoff, Hall and Macdonald, New York
Substructure Contractors: Massman Construction Co.—Kansas City Bridge Company, Kansas City, Mo.
Concrete Subcontractor: W. F. Magann Corp., Portsmouth, Va.
Superstructure Steel and Steel Bridge Decking: American Bridge Division, United States Steel Company

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Additional facilities for Navy airfield, Nevada

Unit prices are reported here for the runway, taxiway and drainage system, part of the $2.2 million additional facilities at the Naval Auxiliary Landing Field, Fallon, Nevada. The runway is 10,000x200-ft, with necessary shoulder stabilization and a 1,500x 100-ft runoff area at each end.

The work consists of excavation, subbase and base coat, Portland cement concrete pavement, asphaltic concrete pavement, road mix surfacing asphalt stabilized surfacing and asphalt penetration treatment.

The lump sum price for the supporting facilities includes site clearing, except buildings, runway and taxiway marking, clearing existing drains and pipe, drop inlet, cattle guard, duty building, water supply system, fuel storage and handling system, three high explosive magazines, three fuse and detonator magazines, inert materials storehouse, and all electrical systems.

The contractor must furnish all mamaterials except some electrical material which is to be furnished by the Government.

Minimum wage rates per hour for this project are: Asbestos workers, $2.585; boilermakers, $2.68; bricklayers, $3.00; carpenters, $2.475; cement finishers, $2.25; electricians, $1.85 to $3.00; fence erectors, $2.35; power equipment operators, $1.92 to $2.75; truck drivers, $1.60 to $2.20; iron workers, $2.45 to $2.70; plumbers, $2.75; laborers, building construction, $1.50 to $1.80; and laborers, heavy construction, $1.30 to $1.60.

Work is under the direction of the District Public Works Office, Twelfth Naval District, San Bruno, California.

Work began in June and must be completed in 375 days with liquidated damages set at $775 per day.

Bidders include:

1C	Peter Kiewit Sons' Co., San Francisco	$2,259,762
2	Dodge Constr. Co. Fallon, Nev.	2,449,900

Bids: 5-28-52		Quan-	Unit Prices	
Items	Unit	tity	1 C	2
Excavation	cy	537,600	$0.55	$0.49
drainage ditch	cy	26,360	0.45	0.25
Pit run base course	cy	89,814	1.60	2.09
Graded aggregate base crse.	cy	45,910	2.30	2.45
Mineral aggr-rd mix surf.	t	31,213	2.00	2.05
asph conc surf	t	38,060	4.00	3.90
Port cmt conc pavement	sy	82,560	3.30	4.75
Asph stab surf	sy	340,460	0.07	0.09
Screenings for seal coat	t	1,090	6.00	5.00
Asph prime coat (MC–1)	t	608	40.00	36.00
Asph, road mix (MC–3)	t	1,875	35.00	32.50
asphaltic conc. (AP–3)	t	2,280	30.00	30.00
stabilized surf (MC-3)	t	2,530	35.00	32.50
penetration (SC–2)	t	47	40.00	33.00
Emulsified asphalt, seal & tack coats	t	110	40.00	36.00
Portland cement	bbl	39,784	5.00	5.68
Reinf conc pipe, 18"	lf	912	7.50	6.00
24"	lf	820	10.50	8.00
30"	lf	180	13.00	11.00
36"	lf	1,460	17.50	16.00
Boundary fence	lf	19,550	0.30	0.30
Security fence	lf	11,972	2.20	22.50
Supporting facilities	ls	1	$657,800	$7000,92

Asphalt runway, Texas

A runway, 8,000 by 200-ft, with supporting taxiway and drainage systems, being constructed at the Corpus Christi Naval Air Station by Brown & Root, Inc. will cost $2.6 million. C. O. Reinhardt is the officer in charge of construction.

Work includes site clearing, grading, stabilization of shoulders, installing concrete drainage pipes, with drainage structures, underground electrical ducts, fencing, topsoiling, mulching, seeding and fertilizing. The runway is to have a flexible base, asphalt surface, with 500-ft of reinforced concrete pavement at the ends. It crosses three existing runways and airport operation must be continuously maintained.

Minimum hourly wages for this project are: air tool operator, $0.90; carpenters, $2.25; cement finishers, $2.25; electricians, $2.61; pipe layers, $1.125; power equipment operators, $1.25 to $1.75; truck drivers, $0.90 to $1.00; ironworkers, reinforcing, $2.20; blacksmith, $1.70; asphalt heaters, $0.90; rollers, $1.50; shovels, $1.50; distributors, (bit. surf.), $1.25; and unskilled laborers, $0.80.

Work began in June and must be complete in February, 1952 with liquidated damages set at $900 per day.

Bidders include:

1C	Brown & Root, Inc., Houston, Texas	$2,642,139
2	Heldenfels Brothers, Corpus Christi	2,831,719
4	Word-Texas-Dellinger, Corpus Christi	3,458,838

Bids: 4-9-52		Quan-	Unit Prices	
Items	Unit	tity	1 C	2
Site clearing	ls	1	$6,000	$49,500
Excavation	cy	577,634	0.36	$0.71
Borrow, on-site	cy	135,794	0.36	0.57
off-site	cy	301,409	0.73	0.73
Concrete, type D	cy	100	39.00	20.00
type E	cy	4,150	35.00	32.00
Reinforcing steel	lb	738,000	0.11	0.105
Reinf conc pipe, std str-21"	lf	850	7.35	5.20
36"	lf	930	13.60	10.40
48"	lf	661	20.50	16.70
84"	lf	1,730	54.50	44.50
est str, 18"	lf	605	6.60	4.80
ext str, 24"	lf	1,511	9.50	7.15
ext str, 27"	lf	670	10.90	8.20
ext str, 30"	lf	1,970	11.90	9.25
ext str, 33"	lf	670	13.90	11.50
ext str, 36"	lf	967	14.50	12.30
ext str, 42"	lf	680	18.60	15.05
ext str, 60"	lf	520	32.80	27.35
ext str, 66"	lf	260	38.90	32.65
ext str, 72"	lf	1,080	45.00	37.45
ext str, 78"	lf	650	53.30	44.40
Mono conc pipe, 24"	lf	325	13.20	15.20
30"	lf	125	17.40	19.30
60"	lf	220	39.10	23.70
66"	lf	90	48.10	30.90
Adjust drain struct	ea	11	25.00	190.00
Stab shoulder & subbase	cy	23,621	0.65	0.39
Bit mat for stab	gal	537,377	0.14	0.135
Binder-crushed stone base	cy	34,233	3.45	5.50
Aggr-crushed stone base	cy	51,350	5.55	5.20
Bit prime coat	gal	27,420	0.18	0.15
Bit tack coat	gal	13,577	0.18	0.18
Bit mat for hot mix	t	2,505	30.00	27.50
Aggr for hot mix-wear crse	t	13,342	5.40	5.45
Aggr for hot mix-bind crse	t	26,931	5.30	5.10
P cmt conc pavement, 11"	sy	66,228	5.20	5.60
15"	sy	2,334	7.35	7.00
Seal coat aggr, type 1	t	590	5.15	5.15
type 2	t	1,237	5.15	5.40
Bit mat for seal coat	gal	109,525	0.20	0.165
Topsoil planting	cy	223,300	0.81	0.74
Sprigging	ac	91	485.00	62.00
Fertilizing	ac	277	75.00	57.50
Seeding	ac	277	40.00	20.50
Mulching	ac	91	70.00	125.00
Mud shell roads	cy	5,200	2.70	3.25
Marking	ls	1	$3,400	$2,900
Fence, Sec. 2	lf	760	$3.20	$2.40
sec. 3	lf	2,400	1.50	1.62
sec. 4	lf	900	4.30	1.62
New fence	lf	7,265	2.50	2.98
Undergrnd elec duct—				
32 way	lf	630	17.00	23.20
9 way	lf	1,340	5.10	7.15
6 way	lf	1,325	3.75	5.20
4 way	lf	2,205	2.60	3.65
3 way	lf	1,955	2.25	2.95
2 way	lf	1,680	1.60	2.20
Airfield light vault	ls	1	$10,600	$12,000
light manholes	ea	2	835	1,000
Cable 1/c #8 AWG	lf	60,000	$0.12	$0.041
Control cable, 15/c	lf	8,000	0.30	0.092
Railroad relocation	ls	1	$30,000	$27,700

Airport paving costs

Bid prices reported here are for airport runway pavement, rigid and flexible, as shown in contracts let by the Corps of Engineers, January, 1951 to January, 1952. These prices include clearing, grading, drainage and electrical ducts.

			Price range/sy		
	No. of sy	%	Min	Ave*	Max
Rigid	7,900,000	47	$3.77	$8.67	$20.37
Flexible	8,900,000	53	3.62	7.82	19.25

*17 jobs bid competitively

Quay wall, California

A cyclopean and mass concrete quay wall, 1,612 by 65-ft, is under construction at Long Beach Outer Harbor, California. Located at Pier D, it will extend from elevation minus 40 to plus 22. Tremie concrete is being poured into cyclopean rock to mean tide level with mass concrete to 10-ft wide throat at elevation plus 10 and cantilever above. The entire wall is being built on a 10-ft mat of quarry waste rock placed in a dredged trench. The contractor will be furnished with 165 tons of used rails for reinforcing.

Work is under the supervision of E. J. Amar, Port Manager for the Board of Harbor Commissioners.

Prevailing wage rates for Long Beach are: Carpenters, $2.35 to $2.43; pile drivers, $2.25 to $2.78; cement finishers, $2.38 to $2.50; iron workers, $2.38 to $2.70; operating engineers, $1.98 to $2.68; suction dredge workers, $1.79 to $2.59; truck drivers, $1.75 to $2.18; and laborers, $1.67 to $2.25. Divers with gear, tender and insurance will receive $105.00 per day; without gear, etc., $45.00 per day.

Work began August 1st and must be completed in 475 days. Bidders include:

1C	Connolly—Pacific Co., Long Beach, Calif.	$1,811,800
2	Walter C. Groshong, Long Beach	1,855,658
6	Macco Corp., Paramount, Calif.	2,438,815

Bids: 6-24-52		Quan-	Unit prices	
Items	Unit	tity	1 C	2
Dredging & deposit mat'l[1]				
south part, pier E	cy	45,500	$1.00	$1.17
behind berth 118, pier E	cy	45,500	1.45	1.64
pier adjacent to site	cy	45,500	1.45	0.90
Mat—quarry waste rock	t	110,000	2.80	2.80
Quay wall base, by grouting[2]				
with conc, class A[3]	cy	46,100	15.00	15.00
cyclopean rock	t	124,000	4.00	4.50
Upper portion of quay wall				
conc, cls A[4]	cy	11,400	22.00	19.22
Miscellaneous work[5]	ls	1	$20,000	$38,100

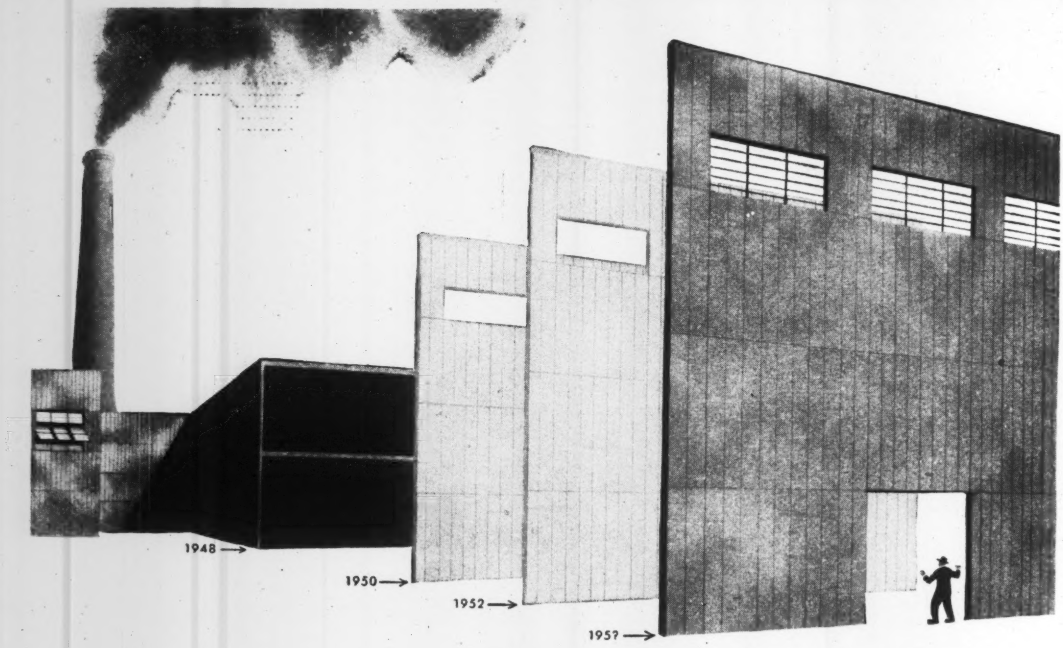
[1] Alternate material disposal areas offerer

[2] Grouting with Prepak Method, alternate, no bids received

[3] Below el. plus 4-ft, including reinforcing

[4] Above el. plus 4-ft, including reinforcing

[5] Includes fender system, cleats and bollards



CASE OF THE WALKING WALL

Twice this wall stepped out to let the plant expand. It could just as well be twenty times.

You simply take the wall apart and move it further out, saving the materials and money involved in building a new one. That's what they did at Dayton Power & Light.

The walls of this building are locked-together Fenestra* "C" Panels . . . long, strong, steel metal units with glass fiber insulation sealed inside.

And, if you build *your* new building of Fenestra "C" Panels, you'll see it go up area by area instead of inch by inch.

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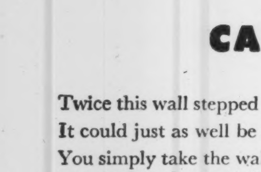
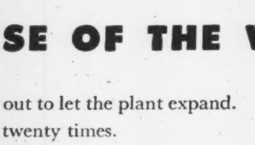
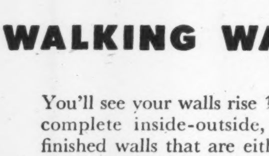


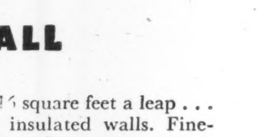
"C" Insulated Wall Panels. Width 16". Depth is 3". Steel or aluminum.



Acoustical Holorib for acoustical-structural roof. Width 18". Depth 1½".



"D" Panels for floors, roofs, ceilings. Standard width 16". Depth 1½" to 7½".



Acoustical "AD" Panels for ceiling-silencer-roof. Width 16". Depth up to 7½".

Irrigation project, Wyoming

Principal parts of a recently begun addition to the Means and Eden Canal in Wyoming are seven miles of earthwork for an earth and concrete lined canal, 2.2 miles of laterals, a radial gate check, 2 Parshall flumes, a wasteway, two siphons, a drop and seven turnouts. A county, a farm, and a state highway bridge are included in the work. All three are timber with mesh and barbed-wire fence. Channel changes must be made by the contractor in Little Sandy and Dry Sandy Creek.

This addition is part of the Eden Project under construction by the Bureau of Reclamation. Alton H. Peterson is the construction engineer.

Minimum wages to be paid are: Carpenters, $2.25; ironworkers, $2.475; power equipment operators, $1.80 to $2.45; pipe layers, $1.87, and common laborers, $1.60.

The work must be completed in 450 calendar days with liquidated damages set at $1.50 per day.

Bidders include:

1C	Young & Smith Constr. Co., Salt Lake City	$514,379
2	Sharrock & Pursel, Casper, Wyo	613,306
3	Guy F. Atkinson & Co., Denver, Col	645,707

Bids. 6-26-52 Items	Unit	Quantity	Unit Prices 1 C	 2
Exc, canal, later, rds, bor				
common	cy	485,000	$0.30	$0.34
rock	cy	44,000	0.30	0.34
Exc, chan & waste Com	cy	46,000	0.30	0.33
rock	cy	32,000	0.30	0.33
Placing earth canal lining	cy	82,000	0.50	0.55
Trim earth fndn for conc lin	sy	6,200	0.75	0.50
Compact earth canal lining	cy	69,500	0.20	0.15
Compact embankments	cy	92,000	0.20	0.20
Overhaul	mi cy	50,000	0.25	0.25
Exc. for struct, common	cy	10,300	1.50	1.50
rock	cy	50	3.00	10.00
Backfill about struct	cy	11,000	0.35	1.00
top of conc lining	cy	55	1.00	5.00
Compact backfill	cy	3,660	3.00	4.00
Riprap	cy	640	10.00	12.00
Gravel & sand bedding under				
rock fill	cy	225	7.00	8.00
Rock fill	cy	1,200	8.00	15.00
Constr reverse filter	lf	19	5.00	20.00
Conc in structures	cy	670	75.00	100.00
Conc in canal lining	cy	725	40.00	60.00
Cement	bbl	2,100	6.00	8.50
Reinforcement bars	lb	133,000	0.16	0.18
Elast fil mat, in jts, ½"	sf	120	1.00	4.50
1"	sf	228	1.00	6.00
Rubber water stops in jts	lf	338	1.00	3.00
Precast conc culv pipe, 18"	lf	92	5.00	10.00
24"	lf	212	7.00	12.00
72"	lf	488	80.00	90.00
Untreat timber in struct	Mfbm	21	300.00	300.00
Treat timber in struct	Mfbm	37	350.00	340.00
Salvaged timber in struct	Mfbm	4.5	200.00	140.00
Metal plate guardrail	lf	176	5.00	4.00
Protective fence	lf	532	0.60	3.00
Radial gates & hoists, 3	ls	1	$6,000	$9,250
Slide gates, 18", 3	ls	1	300	400
24"	ls	1	450.00	500.00
24"x24", 3	ls	1	450	500
30"x24"	ls	1	200	200
36"x30", 2	ls	1	400	600
Blow-off valv & siph connect.	lb	3,500	$0.75	$1.00
Misc metalwork	lb	5,100	1.00	1.00
Remove 5 structures	ls	1	$2,000	$4,000

Shore protection, Chicago

Due to an escalator clause without a ceiling in the low bid, a $1 million contract for the pier bulkheads and jetties along Lake Michigan was awarded to the second bidder by the Chicago Park District. The project, an extension of Lincoln Park, includes steel sheet piling, steel bearing piles, structural steel angle and channel wales, crushed stone fill, reinforced concrete and stone rip-rap.

Work was begun in August, 1951 and was stopped because of lack of steel and because of lake conditions in October, 1951. Resumed in June of this year, allocation of steel is now delaying progress.

Robert A. Black is the chief engineer for the park district. Unit prices are reported here for the three bulkheads, four jetties and a pier.

Bidders include:

1	Great Lakes Dredge & Dock Co., Chicago	$1,018,718
2C	Fitz Simons & Connell Dredge & Dock Co., Chicago	1,055,994

Bids: 4-20-51 Items	Unit	Quantity	Unit Prices 1	 2 C
Bids: 4-20-51 Items	Unit	Quantity	Unit Prices 1	 2 C
Pier A				
Stl sheet piling, reg MP116				
furn & deliver	lb	344,400	$0.055	$0.07
handling & driving[1]	lf	9,570	1.90	1.58
MP116A & 116B				
furn & deliver	lb	24,200	0.12	0.16
handling & driving	lf	460	1.40	2.31
flat type, MP101				
furn & deliver	lb	42,000	0.055	0.07
handling & driving	lf	1,200	1.40	1.55
Steel angle wales	lf	410	7.00	8.32
Tie rods, bolts, and angle braces	ls	1	$2,150	$2,080
Reinforcing steel	t	7	$216.00	$410.00
Crushed limestone fill	t	1,700	9.80	5.70
Concrete work, with exp jts & base for tower	cy	200	75.00	38.74
Jetty—#4				
Stl sheet piling, reg MP115				
furn & deliver	lb	71,300	0.055	0.07
handling & driving	lf	1,980	1.45	1.67
Sloping stl bearing piles,[2]				
furn & deliver	ea	10	111.10	193.50
handling & driving	lf	550	5.00	4.62
Steel angle wales & diaph	lf	100	17.50	12.37
Bolts, nuts, washers & connection angles	ls	1	541.50	680.00
Bulkhead #1				
Stl sheet piling, reg MP115				
furn & deliver	lb	405,000	0.055	0.11
handling & driving	lf	11,250	1.90	1.34
reg MP116, furn & delv	lb	181,500	0.055	0.11
handling & driving	lf	5,040	1.70	1.24
Steel channel wales	lb	15,400	0.45	0.25
Bolts, nuts, washers & connection angles	ls	1	$1,261	730.00
Concrete work	cy	1	$100.00	60.00
Bulkhead #2				
Stl sheet piling, reg MP115				
furn & deliver	lb	787,400	0.055	0.07
handling & driving	lf	21,900	1.34	1.58
MP116, furn & deliver	lb	2,341,500	0.055	0.07
handling & driving	lf	65,000	1.24	1.58
spec, furn & deliver	lb	185,600	0.12	0.16
handling & driving	lf	3,330	1.20	2.41
MP101, furn & deliver	lb	320,300	0.055	0.07
handling & driving	lf	9,150	1.32	1.55
Steel angle wales	lf	4,010	9.90	8.24
Tie rods, bolts & angle braces	ls	1	$12,500	$16,015
Reinforcing steel	t	56	216	4.09
Crushed limestone fill	t	12,800	$9.15	$5.68
Concrete work	cy	1,460	68.00	38.74
Bulkhead #3				
Stl sheet piling reg MP116				
furn & deliver	lb	880,100	0.055	0.07
handling & driving	lf	24,500	1.18	1.58
spec, furn & deliver	lb	59,100	0.11	0.16
handling & driving	lf	1,050	1.10	2.31
MP101, furn & deliver	lb	109,200	0.055	0.07
handling & driving	lf	3,120	1.25	1.55
Steel angle wales	lf	1,050	5.80	8.32
Tie rods, bolts & angle braces	ls	1	$4,049	$5,905
Reinforcing steel	t	18	216.00	410.00
Crushed limestone fill	t	4,530	8.80	5.70
Concrete work	cy	470	$70.00	$38.74
Riprap	t	700	20.00	15.70
Jetties—#1, 2, & 3				
Stl sheet piling, reg MP115				
furn & deliver	lb	197,700	0.055	0.07
handling & driving	lf	5,500	1.70	1.70
Sloping steel bearing piles[2]				
furn & deliver	ea	30	125.00	193.00
handling & driving	lf	1,650	5.40	4.60
Stl ang wales & diaph	lf	300	11.75	12.30
Bolts, nuts, washers & connection angles	ls	1	$1,624	$2,050

[1] All handling & driving includes removal & handling of riprap and other obstructions.

[2] 10-in. CBP #42 55-ft long.

Pier and jetty, Massachusetts

Unit prices are reported here for two projects under construction by the Massachusetts Department of Public Works. (1) A project at Plymouth Harbor includes the construction of a timber pier, walkway and incidental work. (2) A project at Sesuit Harbor consists of the removal of an existing jetty and the construction of a new stone jetty.

Bidders include:

Plymouth Harbor, Mass.

1C	Bay State Dredging & Constr. Co., Boston	$142,058
2	Roy B Rendle & Co. Inc., East Boston	142,496
8	Frank C. Taylor Inc., New Bedford, Mass.	207,520

Bids: 6-24-52 Items	Unit	Quantity	Unit prices 1 C	 2
Exc, below water	cy	700	$1.50	$3.00
Removal of existing pier	ls	1	$7,000	$6,900
Creosoted piles, 30′-35′	ea	93	$85.00	$74.00
35′-40′	ea	171	95.00	84.00
40′-45′	ea	70	97.00	94.00
45′-50′	ea	156	103.00	105.00
Pier & walkway	ls	1	$87,000	$89,290

Sesuit Harbor, Mass.

	Engineer's estimate	$55,810
LB	Bay State Dredging & Constr. Co., Boston	$113,030

Bids: 6-10-52 Items	Unit	Quantity	Unit prices EE	 LB
Dredging, scow	cy	46,000	$0.90	$2.00
Boulders	cy	1	10.00	30.00
New stone	t	2,600	4.00	5.00
Removal of existing jetty	ls	1	$4,000	$8,000

Dredging, Illinois

Bid prices are shown here for two dredging projects by the Corps of Engineers, U. S. Army, Chicago, Illinois. The Indiana Harbor contract consists of maintenance dredging for the main entrance channel to the harbor and also for Lake George and Calumet River Branches. The Peoria and Marseilles Pools contract is for the maintenance and improvement dredging on the Illinois Waterway between Peru and Seneca.

Indiana Harbor

LB	Great Lakes Dredge & Dock Co., Chicago	$135,200
HB	Fitz Simons & Connell Dredge & Dock Co., Chicago	$141,700

Bids: 4-1-52 Item	Unit	Quantity	Unit prices LS	 HB
Channel excavation	cy	130,000	$1.04	$1.09

Peoria and Marseilles Pools

LB	Great Lakes Dredge & Dock Co.	$152,096
HB	Power-Thompson Constr. Co., Joliet, Ill.	191,206

Bids: 5-1-52 Items	Unit	Quantity	Unit prices LB	 HB
Channel excavation, com.	cy	2,200	$1.94	$1.23
unclassified	cy	76,200	1.94	2.50

TV equipment costs, Ohio

A $350,000 contract for the erection of antenna tower and installing transmitter equipment for Station WXEL, Cleveland, Ohio, went to John F. Beasley Construction Company, of Muskogee, Oklahoma.

Rene Brugnoni, of New York City is the architect for the project; Thomas B. Friedman, of Station WXEL, the chief engineer.

Total cost	$350,000
Tower, 700-ft, guyed type, incl. frdn	42,000
Antenna, RCA 12 bay with 6 1/8 in. transmission line	48,000
Station transmitter equipment	260,000

RESEARCH

Pennsylvania coal and sanitary bodies finance acid research activities

For a project under way at the Mellon Institute in Pittsburgh, coal mine operators have agreed to defray half the cost of research done on the problem of stream pollution from acid drainage.

Since 1946 the research fellowship has been supported by the state's Sanitary Water Board, but legislative delays had left the board without any assurance as to when to expect funds for continuing the work. In the meantime, Mellon Institute carried on.

Since industry has shown its willingness to contribute, the state has also provided funds. So that now the expense of the research is shared by the state and by these groups—Bituminous Coal Research, Inc.; the National Coal Association; Western Pennsylvania Coal Operators Association, Central Pennsylvania Coal Producers Association; Ohio River Valley Water Sanitation Commission, Mineral Producers Association; Ohio Coal Industry Water Pollution Committee and various "captive" mines.

Practical results are expected.

It is said that mine acid is the hardest kind of pollution to eliminate, as such drainage is the result of a natural process that goes on 24 hours a day indefinitely. No matter whether the mine is worked or abandoned, the action of air and water on the sulphur-bearing compounds tends to continue the production of acid.

This research has proved that it is futile to attempt to neutralize mine acid discharges. Limestone is a neutralizing agent and Pennsylvania is a leading producer of limestone but it it is said that not enough is mined in the whole state to neutralize the amount of acid produced in Western Pennsylvania alone.

The Mellon Institute work has found the most efficient ways to go about neutralizing acid water in old stripping before removal and in treating temporary discharge in special mining operations.

To make laboratory study of truck concrete mixers

What is believed will be the most comprehensive investigation of truck mixers ever made will be carried out in the next few weeks by the National Ready Mixed Concrete Association in cooperation with the Truck Mixer Manufacturers Bureau.

The tests will be conducted by the association's staff at its research laboratory in the college of engineering, University of Maryland.

The uniformity of concrete mixed at different rates and for different times in full-size truck mixers will be studied by means of tests for strength, consistency and proportions of ingredients. Samples will be taken throughout the discharge of the batch.

Studies of the effect of volume of batch, from considerably below rated capacity to considerably above also will be made. The work will be carried out over a period of two months, and is planned to involve tests of about 100 batches of concrete from standard truck mixers.

Timber roof truss tested for small houses

A timber roof truss especially designed for story-and-a-half houses has been built by the University of Illinois Small Homes Council as part of a research study sponsored by the Housing and Home Finance Agency. The truss is now undergoing a long test for rigidity and strength.

On a 24-ft roof span this truss will provide a second floor room 12 ft wide with a ceiling height of $7\frac{1}{2}$ ft. This living space can extend the full length of the house and can be divided into rooms. Heretofore, roof trusses have not been of a design to permit builders and contractors to allow space for living purposes on the upper floor of such houses.

Because of construction economies and the flexibility in room arrangement made possible by trusses, they have become a popular means of roof construction recently. They do away with the need for load-bearing partitions and their costly supporting construction.

The truss designed by the council provides a protective overhang on both sides of the house. The roof pitch is held to 8 on 12.

The roof is being tested for a load equal to about 5 ft of snow per sq ft, while additional blocks representing a normal occupancy load of 30 lb per sq ft have been placed on the bottom member which supports the floor of the upper story. The test will run several months. Findings will be submitted to Joseph H. Orendorff, who is director of the Housing and Home Finance Agency division of the housing research.

TVA announces new process for slag aggregate

The Tennessee Valley Authority has developed a process for making a light-weight aggregate which more than doubles the value of byproduct electric phosphorus furnace slag, from which the new material is made.

The announcement said TVA believes the new process offers considerable promise to the electrical phosphorus industry which produces large tonnages of the byproduct slag, as well as to manufacturers of such products as concrete building blocks. The process has been developed through the pilot-plant stage and tests have been made on a larger scale.

The process involves tapping molten slag from the furnaces into a hearth and adding steam and water at the same time. This expands the slag to form a porous mass, looking not unlike a sponge. After cooling, the expanded slag is crushed to size.

Market value of the expanded slag is more than double the value of the ordinary slag. It weighs only one-half to two-thirds as much.

Some of the product made in the TVA plant was used successfully by commercial manufacturers of concrete blocks.

This concrete is resilient

A resilient concrete floor surfacing which can be sanded, waxed and polished and which will not interfere with a radiant heating system below, was recently developed at the Research Foundation of the University of Cincinnati.

The new material is the result of more than six months work by Robert T. Howe, assistant professor of civil engineering, under a continuing research contract with Sakrete, Inc., Cincinnati manufacturer.

The strength of the material is claimed to be more than 600 psi. As a resurfacing material is can be applied in sections as thin as $\frac{1}{4}$ to $\frac{3}{8}$ in. It can be used directly over wooden flooring, so that floors of industrial plants may be resurfaced quickly without removing the original floor.

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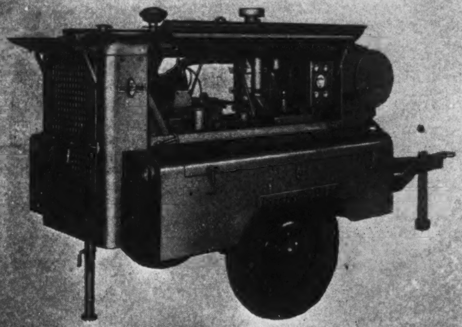

GYRO-FLO 105	Capacity, 105 cfm at 100 psi. Total weight, 2630 lbs. GM 2-51 diesel or Continental F-162 gasoline engine.
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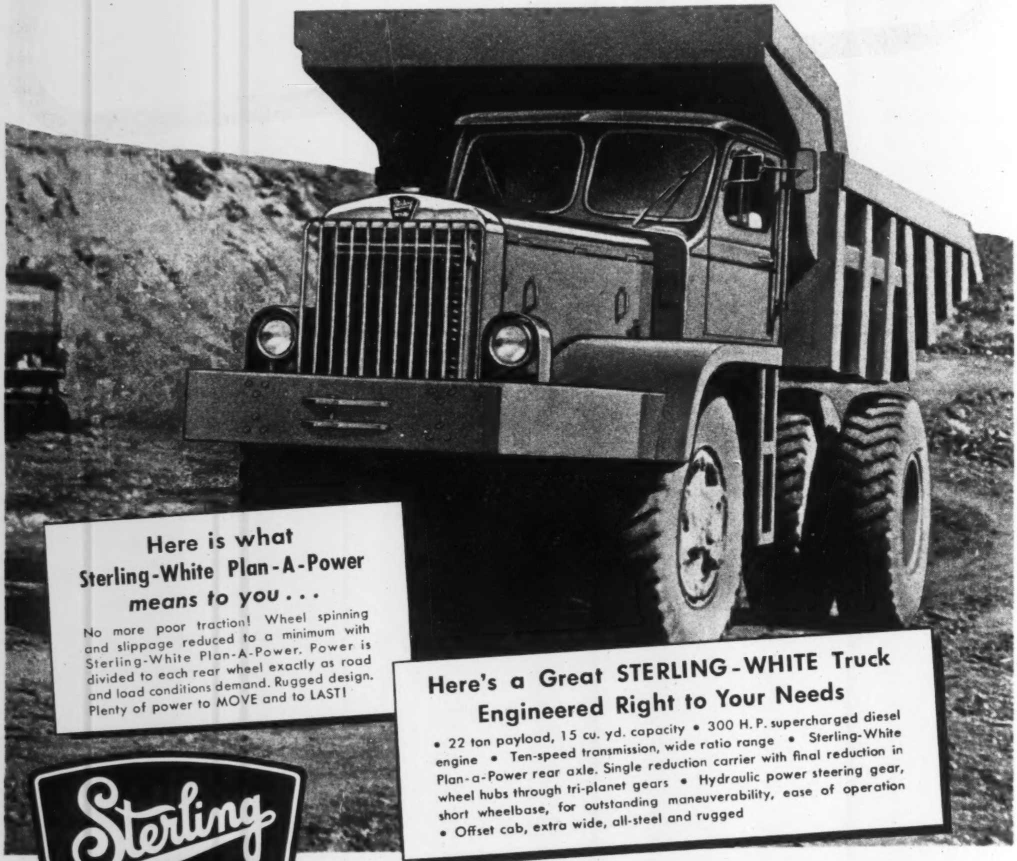

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ENGINEER AND EMPEROR—John L. Humbard shows Emperor Haile Selassie new road building equipment.

Humbard builds Ethiopian roads

John L. Humbard, division engineer of the U. S. Bureau of Public Roads and director of highways of the Imperial Ethiopian Highway Authority, returned to this country to negotiate a $3-million loan from the International World Bank which will be added to a $6-million Ethiopian appropriation to finance construction of a secondary road system.

He received assurances that the loan will be granted. Humbard told ENGINEERING NEWS-RECORD at his home in Fountain City, Tenn., a suburb of Knoxville.

This loan will supplement a prior loan of $5 million now being used—with an Ethiopian $12 million—to create a primary road system.

Humbard was appointed director of the Ethiopian highway system in 1951 by His Imperial Majesty, Emperor Haile Selassie. Humbard first went to Ethiopia late in 1950, returned to set up his American engineering mission and to purchase equipment. He began actual work in Ethiopia in February, 1951.

By agreement among the State Department, Bureau of Public Roads, International World Bank and the Imperial Ethiopian Government, administrative and technical advice are furnished Ethiopia for a modern highway system.

• **Primary roads**—Following this appointment, Humbard turned to construction of the primary road system, a back-breaking project complicated by long, tedious lines of supply.

The secondary road network will extend some 2500 mi and will funnel produce from the provinces to primary roads. When completed, the primary system will have 5000 mi of roadway. About 4000 mi was part of the Italian Occupation highway system, but only 2000 mi were completed by the Italians and the remainder had disintegrated through lack of maintenance. It was Humbard's job to rehabilitate these remnants and add sufficient mileage to produce a sound system.

• **New engineer**—Humbard represents a new concept in engineering, the "good will ambassador" who combines technical assistance with friendly, intense interest in an undeveloped nation.

Not only are Humbard and his mission constructing a road system. They are also creating a highway authority based on state highway departments in the United States. The magnitude of this job is underlined by the fact that there is only one Ethiopian engineer, a graduate of a U. S. university in 1950.

Humbard said: "Our ultimate objective is a highway system to permit Ethiopia to realize her potential wealth. It is estimated that Ethiopia could produce enough grain and other foodstuffs to feed 90 million people. Yet its population is between 12 and 15 million."

Much of Ethiopia's natural resource is being squandered because the highway system does not tap the rich interior. "Only one-fourth of the wild coffee is accessible," he said. "Thousands of tons are destroyed by monkeys each year. Yet this commodity would demand top prices on the world market."

• **Career**—The 60-year-old, white-haired Humbard is a wiry man with 40 years of engineering experience.

He began his active career while studying at St. Joseph College in Baltimore. His first job was with the firm of W. J. Oliver of Knoxville, Tenn., building a railroad from Spartanburg, to Belton, S. C. In summer, still attending school, he worked for Consolidated Coal Mining Co. of Baltimore, resurveying old mines near Cumberland, Md.

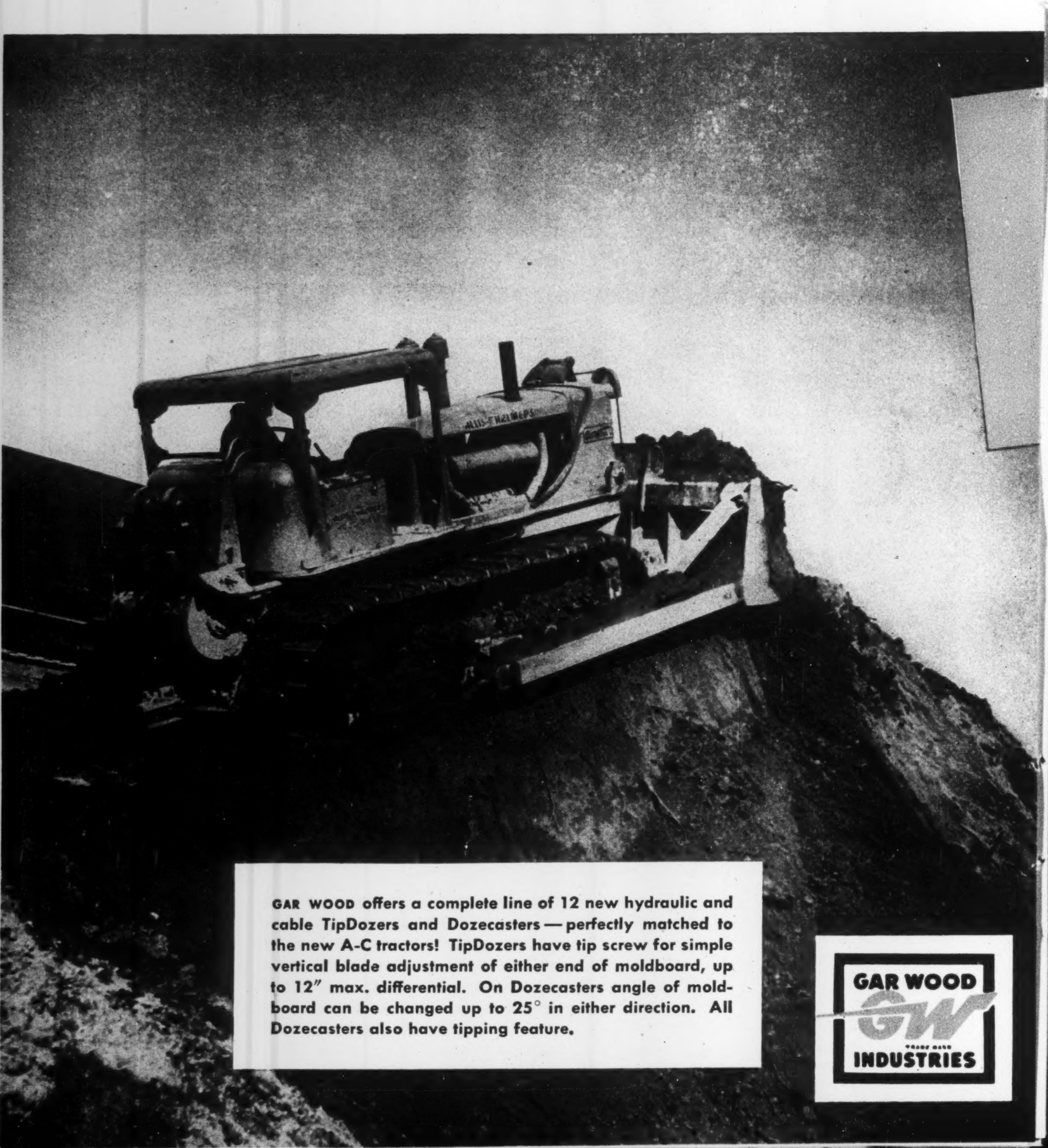
In 1930-31, he owned and directed the John L. Humbard Construction Co. of Knoxville, operating in Tennessee, Louisiana, Kentucky, South Carolina, and Mississippi. During that time, he organized one of the South's first ready-mixed concrete plants. The firm was liquidated after the crash of the early thirties.

It was then that Humbard began his career with the federal Bureau of Public Roads.

Humbard then began construction of a road from Gatlinburg to Mt. Le-Conte in the Great Smoky Mountains, supervising much of the work as division engineer. He also supervised construction of the Blue Ridge Skyway between Blowing Rock and Linnville, N. C., and built the stone bridge over precipitous Linnville Gorge.

• **Overseas**—In the fall of 1939 he began his overseas career. As chief engineer of construction in Panama,

More **PUSH** from



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Construction Equipment: Excavators, Scrapers, Dozers, Ditchers, Spreaders, Finegraders, Truck-mounted Road Graders. Truck Equipment: Dump Truck Bodies & Hoists, Winches & Cranes, Refuse Collection Bodies, Elevating End Gates.

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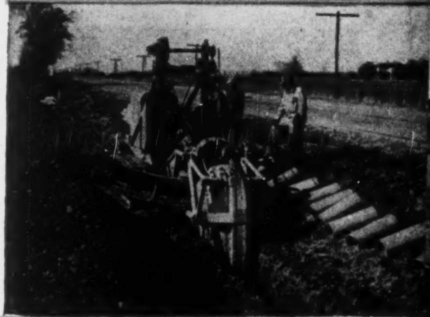
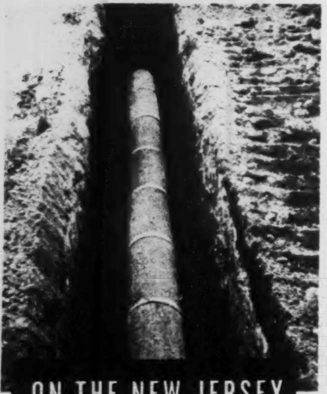


- **BUCKEYE DITCHERS—A complete line of wheel and ladder-type ditchers. Also Finegraders and Spreaders.**



ON THE NEW JERSEY TURNPIKE, TOO

Another Big Rapid Drainage Job For Walker Poroswall Rapid Drain Pipe

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98 BERGEN TURNPIKE
LITTLE FERRY, NEW JERSEY

IMPERIAL VIEW—Emperor gets close look at building work.

Builds Ethiopian Roads . . .

he was in charge of surveying, engineering and construction of a 100-mi road from Chorrera to Rio Hato, where the U.S. Air Force was constructing a huge bomber base.

He was also in charge of engineering and construction of what is now known as the Trans-Isthmian Highway from Colon on the Atlantic side to Panama City on the Pacific side. This was one of the most difficult highway projects ever undertaken.

Humbard also supervised construction in Costa Rica and Nicaragua and conducted inspections of all work on the Inter-American Highway in Central America, from the Mexican border to Panama. In 1943, during World War II, he was in charge of projects in Puerto Rico.

In March of 1943, he was in charge of construction of the Alaskan Highway, a 1563-mi road from Fairbanks to Dawson. When this was completed in the spring of the following year, he returned to Panama. He built Tocumen International Airport for the Republic of Panama.

After this was completed, Humbard remained in Panama, completing studies and plans for the International American Highway from Costa Rica to Rio Hato, a 200-mi strip. He also supervised road surveys in the Virgin Islands at that time, as well as other projects in Puerto Rico.

He was on these assignments until October, 1950, when he was given the task of engineering inspector of work in Turkey. He was en route to this job when he was ordered to Ethiopia to study its highway requirements.

• Methods—In Ethiopia he is following a method of operation he developed in Panama and Central America, building from the ground level. He is a "firm advocate in taking the wrinkles out of a man's stomach before demanding a real day's work."

Setting up a highway department in an undeveloped country is a tough job. Humbard is forming divisions of accounting, administration, maintenance, construction, design and planning.

The planning division is already at work on a long-range transportation system to funnel exports to the coast and imports to the interior.

"We have 4,200 Ethiopians and Europeans in our administrative and engineering departments," Humbard said. "I have only 42 American technicians with me. We are training Ethiopians in all divisions of engineering and construction, including operation and maintenance of equipment.

The Ethiopian Government has bought some $3.5 million worth of

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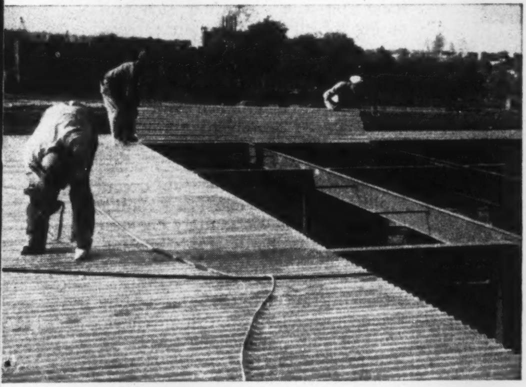
. . . the light-weight permanent steel form for concrete floors and roofs.



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And "tough-temper" steel is the answer. Yes, high-strength, light-weight steel is one of the reasons that the Granco family of four building aids do a better job for you. For Granite City Steel, parent-company of Granco Steel Products Company, has developed a specialized steel to fit right in the building products picture.

Because it's manufactured from a low-carbon steel to begin with, Granco "tough-temper" does not require critical alloying to gain its high tensile strength. Instead, controlled cold-rolling, with strain hardening as the result, gives high and unusual physical properties. The structure of the steel itself actually changes . . . the crystalline elements realign . . . to produce a steel with a *minimum* yield point *above* 80,000 psi; and an ultimate of *over* 100,000 psi. This is *tough* steel!

Steels like this, fabricated into products like those illustrated on this page, mean more than marks on a blueprint. For construction people they mean simplified and more economical construction, savings in materials and labor. To your clients they mean better structures as an end-result.

We'll be glad to tell you more about any Granco product you are interested in, just write Department 20-6, you will get a speedy answer. For helping you is the most important part of our job. It's our way of saying "thanks" for specifying Granco.

TUFCOR

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GRANCO ROOF DECK

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GRANCO STEEL PRODUCTS CO.

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is faster with
"COMMERCIAL"
steel
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YOUR COST WILL BE LESS!

Tunneling operations which require support will progress faster, more safely, and at lower cost when "Commercial" steel tunnel lining products are erected in the heading. Steel ribs accurately formed and completely fabricated, when placed inside the design line, become part of the permanent lining and can be erected more quickly by fewer, less skilled men. "Commercial" engineers will gladly assist you; they have the experience and know how.

FORMED RIBS

Driving Speed Increased

LINER PLATES

Lower Cost Of Erection

STEEL LAGGING

No Additional Excavation

KEEP DRIVING AHEAD—USE "COMMERCIAL" TUNNEL SUPPORTS—THEY ARE MORE IN DEMAND THAN EVER BEFORE.

"COMMERCIAL"

THE COMMERCIAL SHEARING AND STAMPING COMPANY
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equipment, Humbard said, and by the end of this year, the total will be $5 million. The emperor's policy is to purchase equipment and materials with money from the World Bank. Payment of American personnel also is made from the loans.

As a native nucleus, Humbard had one Ethiopian engineer, Ato Syuam, a graduate of the University of Kansas.

"A complete training school was established for Ethiopians," Humbard said. In operation two years, this school has a class of 100. Students are trained in the operation and maintenance of equipment and instructed on operations of district shops, which are equipped with lathes, drills and presses.

"Installations include construction of a tire-recapping plant," Humbard said. "The roads are such that 5000 to 6000 mi is all you can get out of tires without recapping."

The highway authority also operates two flour mills and some camps for workers. Each Ethiopian laborer who does not live in one of these camps receives four and one-half pounds of flour a day, a primary ingredient of a basic native bread. The Ethiopian religion – Coptic Christian – requires some 200 days of fasting each year during which no fowl, meat, eggs, butter or oil can be eaten. Vegetables can be eaten during these times, but in most areas these are not obtainable.

Humbard is determined to work out a solution to the problem of providing laborers with sufficient nourishment at all times. The camps provide modern sanitation facilities and the overall health program includes a public health doctor and a sanitary engineer to assist in the battle against malaria, amoebic dysentery, and other diseases.

• **Construction**–Construction work in Ethiopia was also begun from scratch. "All of the engineering data the Italians used in construction of their highways were destroyed, even the bench marks. This made it necessary for us to make complete surveys of drainage areas as well as for construction and reconstruction of highways. We are now planning to make aerial maps of all the area covered by the highways.

"During the Italian occupation," Humbard said, "about 2000 mi of stone base roads with penetration asphalt surface were completed, with another 2000 under construction. At the peak of their operations, they had 140,000 men at work. During the war, most of the bridges were destroyed. There was no maintenance, so the road system disintegrated."

Coping with tremendous distances and long supply lines without adequate transportation is a constant headache. "For example," Humbard said, "we ship cement 340 mi over the French-Ethiopian Railway to Djibouti, the port in French Somaliland. From there it is carried in small coastal boats called dhows down the Red Sea 200 mi to Assab in Eritrea.

"It is then taken to Massawa, another Eritrean port, unloaded there, and hauled 75 mi by narrow gage railway to Asmara. Then it is carried by truck 450 mi to Lake Tana, the headwaters of the Nile. It is then carried across the lake by boat 50 mi to a bridge we are building across the Little Blue Nile."

Transporting materials from 100 to 500 mi by truck is commonplace, he said. To combat this problem, airstrips are being built in the desert near construction camps. One desert airport is already in use 350 mi from Addis Ababa.

• Honors – Humbard revealed that Ethiopia's pro-American government requested American supervision of its highway construction. The emperor, whom Humbard deeply respects, has entertained the American engineer in his palace in Addis Ababa and has shown a keen interest in the highway system, even to small details. He makes frequent inspections, accompanied by his official party.

The emperor has let the State Department know that he would regret any change in personnel that would take Humbard away from his task.

Thomas MacDonald, commissioner of the Bureau of Public Roads, recently spent six weeks with Humbard in Ethiopia. MacDonald has said that Humbard's "peculiar genius for organization has never been demonstrated so ably under such difficult circumstances" as in Ethiopia.

Humbard has received a number of medals and awards. He was presented a Gold Medal of achievement by Secretary of Commerce Charles Sawyer in Washington, following his return from Ethiopia in July for "outstanding performance" in overseas duty. He has been honored by the Republic of Panama, which appointed him American technical consultant to that country, by action of the General Assembly.

Among the honors bestowed upon him was the order of Vasco de Nunez de Balboa by President Jimenez of Panama, with the rank of Sir Knight,

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YOUR COST WILL BE LESS!

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Finger-tip gearshifting for heavy-duty

Allison TORQMATIC Transmission quick-shifts under load at full throttle—saves time—cuts operating and maintenance costs

PERFECT teammate for the famed Allison Torqmatic Converter is this Torqmatic Transmission — an exclusive development that takes the work out of gearshifting in even the largest off-highway trucks and heavy earth-moving vehicles.

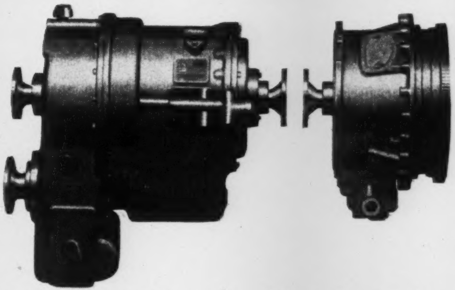
Embodying the same basic design principles as the Allison Torqmatic Transmission, which has long been used in U. S. armored vehicles, this Allison quick-shift transmission eliminates "gearshift guess"—puts an end to laborious clutch pedal pumping and the usual manual gearshifting.

Unlike conventional sliding-gear types, the Allison hydraulically controlled *Torqmatic* is a constant-mesh, planetary-gear transmission. With a simple flick of a lever, the driver can shift from one range to another *at full load without taking his foot from the throttle*—and without losing momentum.

A Smooth Power Flow

Coupled with the cushioning effect and automatic features of the Allison Torqmatic Converter, this transmission greatly extends the torque converter's capacity. This means that trucks up to 50-ton pay load can climb steep grades with the smoothness and operating ease you enjoy with an hydraulic transmission in your car. It cuts maintenance. It increases truck life. It reduces operator fatigue. It enables drivers to handle bigger pay loads on faster schedules. *It gets more work done at lower cost per ton-mile.*

SCRAPERS



Allison Torqmatic Transmission | **Allison Torqmatic Converter**

UNBEATABLE TEAM

—for maximum operating economy

Quick shifts under load at full throttle

Finger-tip hydraulic gearshift control

Combination needs only three forward speeds with one reverse

Power take-off available. Delivers full engine power

Variety of transfer gear ratios available

Simple design—one-piece cast converter elements—minimum maintenance

Compactness simplifies installation

Designed for power application in the 75 to 350 h.p. range

Longer equipment life—less wear on drivelines, axles, chains, sprockets and gears

A matched team—designed to work together smoothly—designed and built by one manufacturer

vehicles

Yes, here is the profit-winning team for almost any heavy-duty vehicle drive—tested in the world's toughest kind of service and proved by thousands of hours' operation in off-highway trucks, tractors and other heavy equipment. For further information about TORQMATIC DRIVES, write to:

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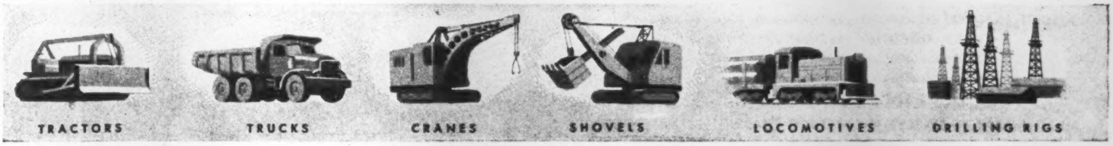
TORQMATIC DRIVES



Highway fund sought for European network

The United Nations Economic Commission for Europe has announced that its Inland Transport Committee has called for the preparation of a draft of a statute for a European road investment fund organization to finance construction of principal international highways in that continent.

The highways which would be improved or built with the fund form part of of 33,600 miles of "E" (for Europe) routes in 20 countries that have been mapped out as a European road network by the governments of the countries in the Economic Commission for Europe.

These governments expect that early construction of modern, heavy-traffic roads in such a network will bring substantial economic and social benefits to their countries. Belgium, France, Italy, Luxembourg and the Netherlands are the countries which so far have declared themselves prepared to participate in the plan as it relates to their countries.

The International Road Federation has been asked to draw up, in consultation with the ECE executive secretary, suggestions of possible methods for international financing of these main traffic arteries—principally in Western Europe.

The proposed main arteries are:

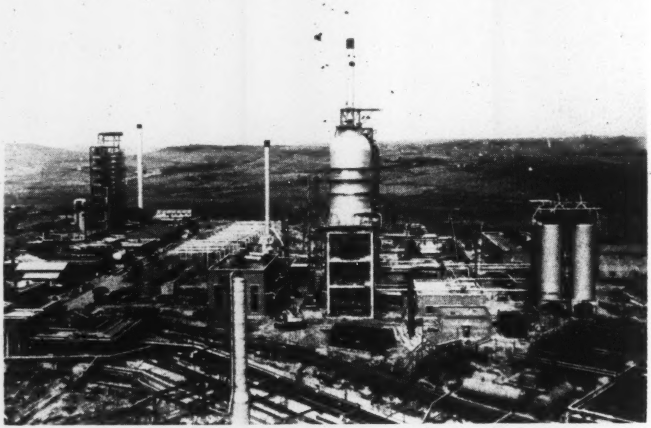
E 1—London, Paris, Nice, Rome, Palermo

E 2—London, Lausanne, Milan, Brindisi

E 3—Lisbon, Paris, Stockholm

E 4—Lisbon, Bern, Copenhagen, Stockholm, Helsinki

E 5—London, Vienna, Budapest,



10,000 BBL-A-DAY—The Kellogg International Corp. of New York is just finishing construction supervision of this 10,000 bbl-a-day fluid catalytic cracker in Llandarcy, Wales. It is one of three similar units in the British Isles being constructed under supervision of the corporation. The other two are in Kent, England, and Grangemouth, Scotland.

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Here's why Schield Bantam is now WORLD'S LARGEST PRODUCER of truck-mounted cranes & excavators!

So many owners are making so much money with Schield Bantam equipment that today this young, fast-growing company *produces more truck-mounted cranes and excavators than any other manufacturer.* In 1951, Schield Bantam also outproduced all other manufacturers of less than ½ cu. yd. excavators COMBINED (including crawler types).

More value per dollar!

Reasons for Bantam leadership are easy to understand. First, Schield Bantam has specialized in developing just *one size* machine, with a complete line of *specially engineered attachments.* By mass-producing this one size unit with modern "assembly-line" methods, Schield Bantam is able to give you *the world's simplest, fastest ⅜ cu. yd. excavator — at the lowest price in the industry!*

Job-proved capacity

Today, over 3500 truck-mounted Bantams are cutting costs on jobs all over the world. Bantam shovels and draglines load pit run material at 90 cu. yds. per hr. Back Hoes dig 100′ of trench per hr. (5′ depth). Cranes, with 25′ to 50′ booms, speed handling of loads up to 5 tons.

Why *pay more* for a machine that can't *earn more!* Let us prove Bantam's economy on your work today.

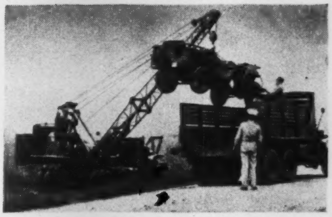
SB-G-4C

SCHIELD BANTAM

First in truck-mounted

Power shovels • Cranes • Draglines • Back Hoes

OK'd for military use!



A new lightweight Bantam shovel-crane, suitable for airborne operations, and other applications impractical for larger machines, has now been standardized by the U. S. Military. Weighs less than 9 tons complete with new 6 x 6 Ordnance truck.

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Bantams are sold and serviced by a world-wide network of 110 leading distributors. This specialized experience in ⅜-yd. application and maintenance is quickly available wherever you go.

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MORE LOADS

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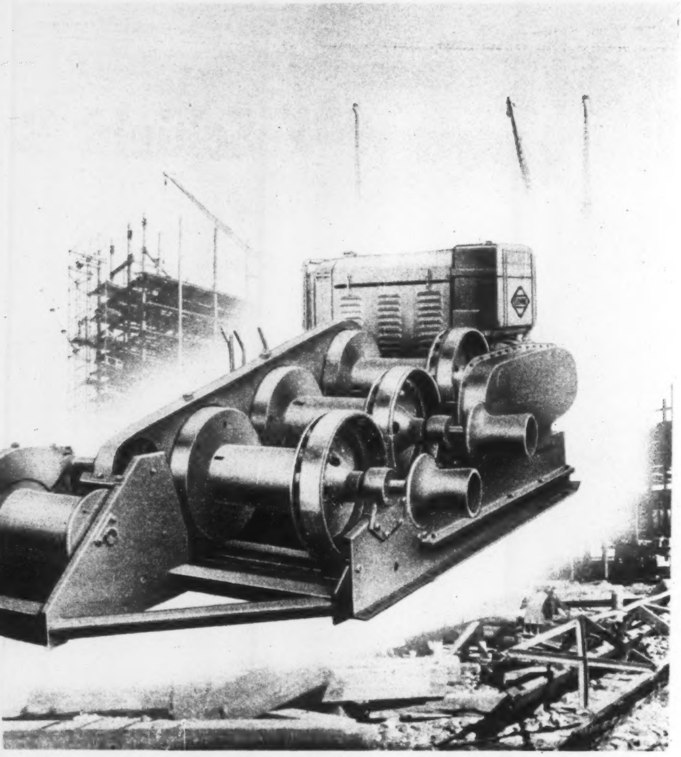

with a

CLYDE BAND FRICTION HOIST

The ease of operation of Clyde Band Friction Hoists permit the operator to concentrate all of his attention on the *safe, sure, accurate* spotting of loads. Convenient and easily-operated controls practically eliminate fatigue . . . and the consequent slowing down and dangerous operations by a tired-out operator. *Smooth, positive* engagement and release eliminate shock loads on cable and hoist and give *split-second control* at all times!

Clyde Band-Friction Hoists are available in one, two and three drum models with nominal line pulls to 21,000 lbs. and line speeds to 400 f.p.m.

Circular MP-48 gives complete information and specifications on these hoists . . . time savers and money makers for all construction jobs. *Write for it TODAY!*

WHIRLEYS • DERRICKS • HOISTS • BUILDERS TOWERS • CAR PULLERS • HANDI-CRANES • ROLLERS

Clyde Internal Friction Bands Dissipate Heat

FASTER, LAST LONGER, ADJUST EASIER!

Friction bands on Clyde Hoists are inside the friction drum, thus permitting the heat to be carried away as it is generated — something impossible when the band surrounds the outside of the drum and virtually forms an insulating blanket around the heat generating surfaces.

At those infrequent times when adjustment needs to be made, it can be done simply and quickly! FRICTION LININGS CAN BE REPLACED WITHOUT REMOVING THE DRUMS! Check all the advantages of a Clyde Band-Friction Hoist before you purchase ANY hoist!

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CLYDE

CLYDE IRON WORKS, Inc.

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E 7—Rome, Vienna, Warsaw

E 8—London, The Hague, Berlin, Warsaw

E 9—Amsterdam, The Hague, Basel, Genoa

E 10—Paris, Brussels, The Hague, Amsterdam

E 11—Paris, Salzberg

E 12—Paris, Prague, Warsaw

E 13—Lyon, Venice

E 14—Trieste, Prague, Szczecin

E 15—Hamburg, Berlin, Prague, Budapest

E 16—Bratislava, Gdynia

E 17—Chagny, Salzburg

E 18—Stavanger, Oslo, Stockholm

E 19—Albania, Joannina, Corinth

E 20—Korytsa, Sofia

Ontario builds highways to overcome bottlenecks

Seven badly needed highway construction jobs in Ontario, Canada, are to be started soon: Steel to complete them will be available, George Doucett, Highways Minister, has announced. About 3,500 tons of reinforcing steel will be needed for the jobs which are estimated to cost about $16,000,000. An all time high registration of 1,182,961 motor cars in Ontario and bad traffic conditions in certain areas this summer have resulted in the immediate go-ahead orders on this program.

Included is a 35-mile controlled-access highway to bypass the cities of London and Woodstock on the main highway between Toronto and Windsor (opposite Detroit). At Kingston a section of a controlled-access highway will be built, which will be on the eventual Toronto-Montreal superhighway.

The new Toronto-Barrie express highway is to be extended to past Orillia with a bypass there. This highway is the most heavily-travelled in Ontario in summer with northbound traffic to Muskoka Lake, Georgian Bay, and other resorts.

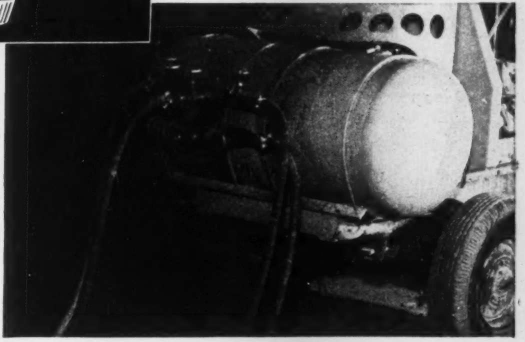
Near Ottawa new approaches from east and west ends of the city to main highways are to be built to connect with the Trans-Canada Highway.

International Briefs

• **F.H.A. in Guam**—A Federal Housing Administration office has been opened in Guam since now by recent legislation residents there are entitled to F.H.A. aid in acquiring a loan up to $12,100 for building a house. The need for housing is great as Guam is now one of the most important mili-

THIS *Versatile* *Coupling*

while used primarily for air-operated tools in field and factory, is equally efficient for water, oil and spray service. Illustration shows hose end and female I.P.T. end connected.



"AIR KING" *Quick-Acting* *Universal* HOSE COUPLING

The "AIR KING" will reduce operating costs on every job requiring quick connection. Heads are locked by simply pressing together and giving one a quarter-turn. These locking heads are identical for all sizes of hose or threaded ends, permitting the coupling of any two sizes of hose, or hose and pipe, within the "AIR KING" size range. Equipped with patented safety locking device. Available in bronze or rustproofed malleable iron, in sizes up to 1".

Two Hose Ends Connected

Male I.P.T. End

Stocked by Manufacturers and Distributors of Industrial Rubber Products

DIXON *Valve & Coupling Co.*

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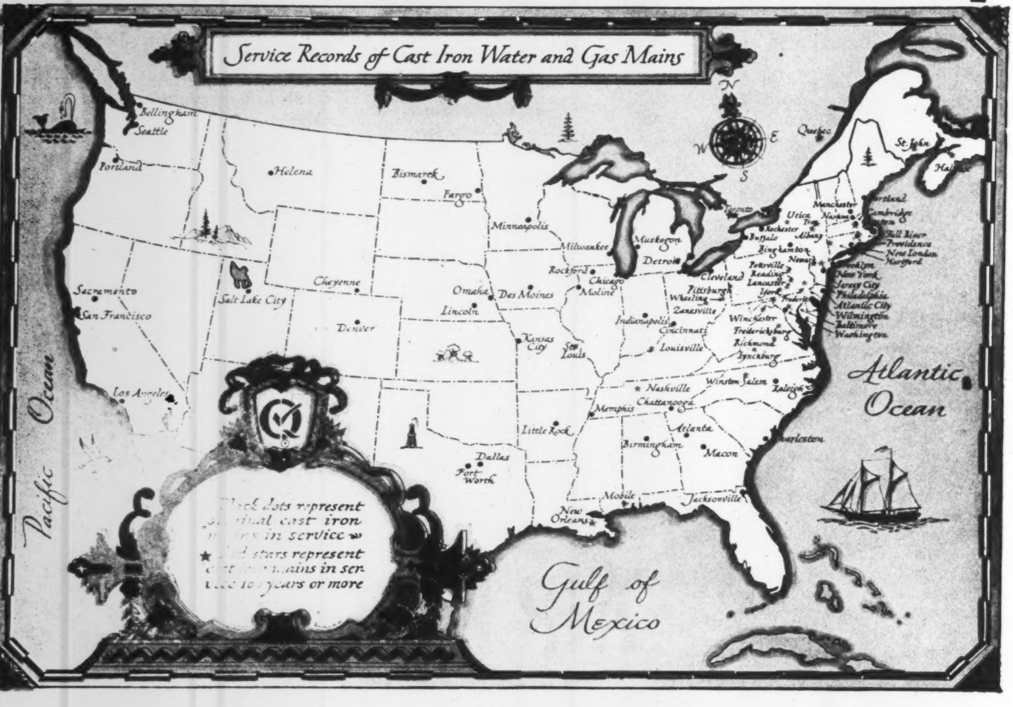
ASSOCIATE COMPANIES: BUCK IRON COMPANY, INC., QUARRYVILLE, PA. • PRECISION DRAWN STEEL COMPANY, CAMDEN, N.J.

No doubt about the economy


Service Records of Cast Iron Water and Gas Mains
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Los Angeles
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Salt Lake City
Cheyenne
Denver
Bismarck
Fargo
Minneapolis
Omaha
Des Moines
Lincoln
Kansas City
St. Louis
Dallas
Fort Worth
Little Rock
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New Orleans
Mobile
Milwaukee
Rockford
Chicago
Moline
Muskegon
Detroit
Indianapolis
Cincinnati
Louisville
Nashville
Chattanooga
Birmingham
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Winston Salem
Lynchburg
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York
Quebec
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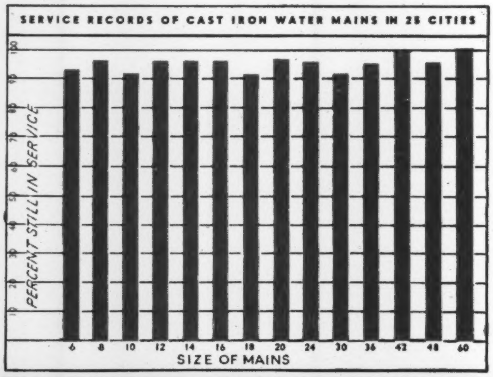
Manchester
Nashua
Cambridge
Boston
Fall River
Providence
New London
Hartford
Brooklyn
New York
Jersey City
Philadelphia
Atlantic City
Wilmington
Baltimore
Washington
Black dots represent original cast iron mains in service
Red stars represent cast iron mains in service 100 years or more



AMERICA PROVES IT! The above map shows cities having some or all of their *original* cast iron water or gas mains still in service. The red stars indicate 34 cities having cast iron water or gas mains in service that were laid a century or more ago.

SURVEYS PROVE IT! A recent study directed by 3 Water Works Associations shows that 96% of all cast iron water mains, 6-inch and over, *ever laid* in 25 representative cities, are still in service.

CAST IRON PIPE

# of CAST IRON PIPE...

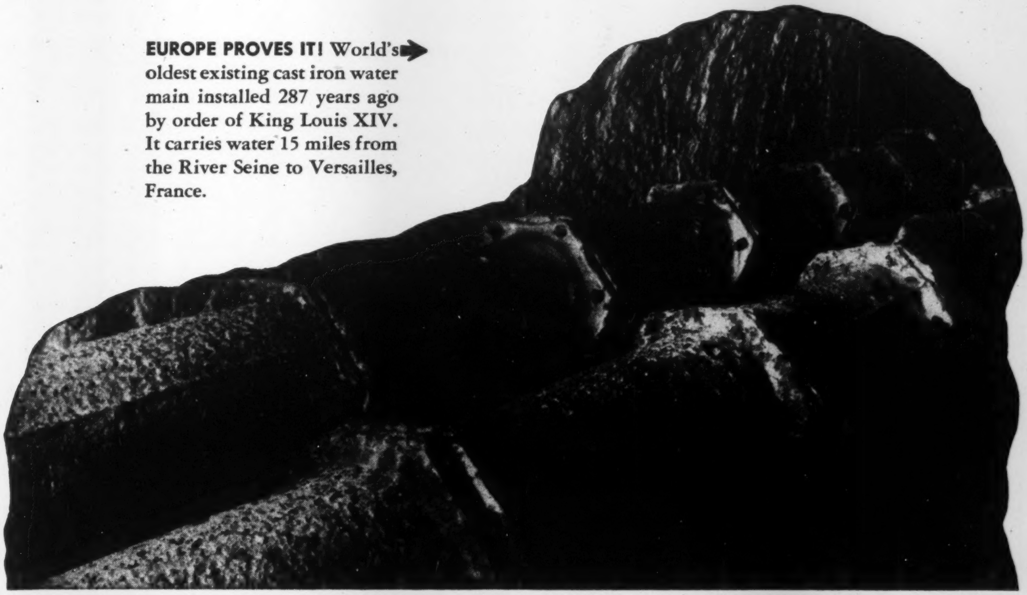
Europe proves it! The oldest cast iron water mains in the world, by authenticated records, supply the town and parks of Versailles, France. They were installed in 1664 and are still functioning after 288 years of service. Other cities in France, Germany and the British Isles have cast iron mains in service that are over 100 years old.

America proves it! Original cast iron mains are still serving 57 of America's largest cities. And over 35 cities have either cast iron water or gas mains in service that were laid over 100 years ago (see map).

Surveys prove it! An exhaustive study, directed by a Joint Committee representing 3 Water Works Associations, shows that 96% of all cast iron water mains, 6-inch and over, *ever laid* in 25 representative cities, are still in service (see chart).

Yes, history proves beyond doubt that cast iron pipe has the stamina and the strength-factors that pipe must have to serve dependably under the paved streets of cities, towns and villages.

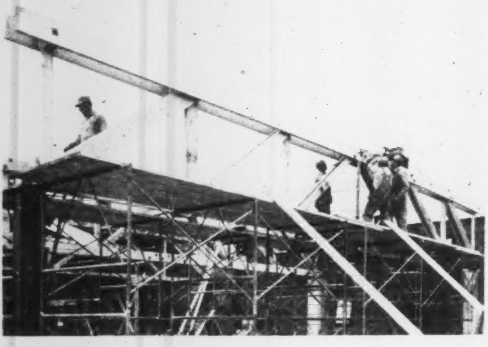
EUROPE PROVES IT! World's ➔ oldest existing cast iron water main installed 287 years ago by order of King Louis XIV. It carries water 15 miles from the River Seine to Versailles, France.



CAST IRON PIPE RESEARCH ASSOCIATION; THOS. F. WOLFE, MANAGING DIRECTOR, 122 SO. MICHIGAN AVE., CHICAGO 3.

SERVES FOR CENTURIES

Structural Wood Framing Systems by Weyerhaeuser



Engineering in lumber has developed a broad line of structural wood products, precision fabricated by Weyerhaeuser. A variety of types of roof trusses is offered: bowstring, flat top, tandem, and pitches, for post-free clear span buildings, 30 feet and wider . . . round top and pitched type trussed rafters . . . segmental arched rafters for 30 to 50 foot spans . . . buttressed arches for 50 to 100 foot spans . . . girders and other wood structural systems.

Fabricated from stress-graded Douglas Fir lumber, these products are delivered to the job site complete with hardware, ready for erection by local crews.

The catalog includes pertinent engineering and design data . . . Write nearest office for the catalog and other information.

STRUCTURAL WOOD PRODUCTS
WRITE FOR FREE CATALOG

WEYERHAEUSER
SALES COMPANY
FABRICATING DEPARTMENT
SAINT PAUL 1, MINNESOTA
TACOMA, WASH. NEWARK, N. J.

tary bases in the Pacific. The island is 30 miles long and from four to ten miles wide. Its population is about 60,000.

• **Israel to export cement**—It is said that by the spring of 1953 Israel should be producing enough cement not only for her own requirements but also will have about 250,000 tons for export. The Nesher Cement Works is now producing 460,000 tons annually, and new plants are being brought into production.

• **Canadian construction**—For the first seven months of 1952 construction contracts in Canada totaled more than a billion dollars. Residential building increased by almost $21 million as compared with the corresponding period of 1951, the chief increase being in the Province of Ontario. At Calgary, Alta., the school board has begun $2,761,179 worth of construction and has just authorized a million dollar expenditure for an additional school.

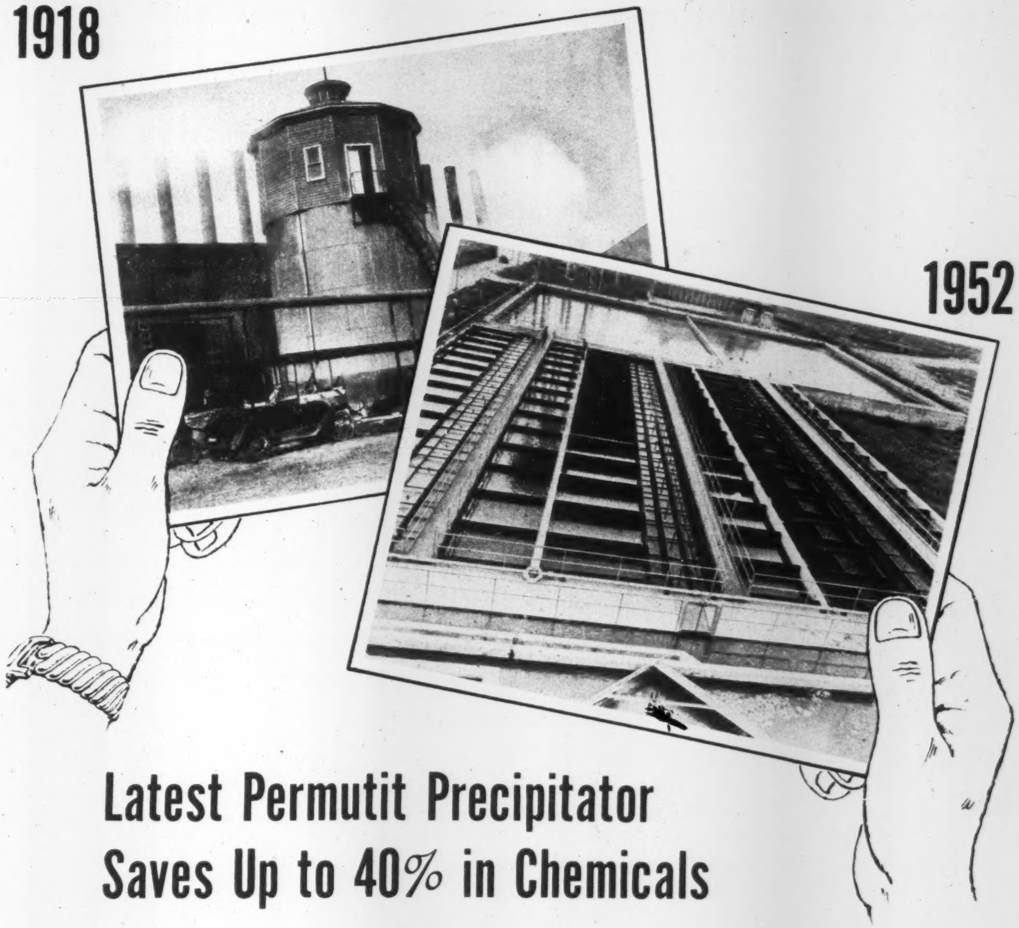
• **Costa Rican fluoridation**—San Jose, Costa Rica, population 80,000, is installing a fluoridation system in its water supply—said to be the first instance of a Latin American city using this means to protect the teeth of its children.

• **Irrigation in Jordan**—The government of Jordan is considering an irrigation and hydro-electric scheme for harnessing the waters of the River Yarmuk which flows along the Jordan-Syrian border. Planning and surveys have been made by American and British engineers. The estimated cost is $38 million, most of which it is hoped will be provided by the United Nations Relief and Works Agency. It is hoped that 186,000 acres can be irrigated to provide farms for 80,000 families, mostly Arab refugees from Palestine. Two hydro-electric power stations will be built, one at the southern end of the Dead Sea.

• **Underground power house** — For Aluminum Co. of Canada's "Project British Columbia," a powerhouse 1,400 ft underground is being built. From four headings, a 10-mile tunnel is being driven through the mountains to carry the water in a 2,600-ft drop from Tahtsa Lake. The rock has been penetrated more than 4,500 ft. A 50-mi transmission line will carry the power to the aluminum smelter at Kitimat, scheduled to start producing in April, 1954.

• **Bonds for improvements**—In San

1918



1952

Latest Permutit Precipitator Saves Up to 40% in Chemicals

Today's sludge blanket Precipitator is the most advanced and efficient type of coagulation, precipitation and settling equipment. It is particularly economical for the removal of turbidity, color, taste and odor; and for softening water, reducing alkalinity and removing silica by the cold lime-soda process.

The secret of its amazing efficiency and adaptability is the full utilization of the suspended sludge-blanket principle. Upward filtration through a blanket of previously formed precipitates results in the complete usage of lime and other chemicals . . . *saving up to 40%.*

Resultant prolonged and intimate contact prevents the formation of "after deposits" in filters and pipes, which in many cases . . . *eliminates the need for recarbonation.* And an effluent averaging usually less than 5 ppm turbidity is produced . . . *easing the load on filter beds.*

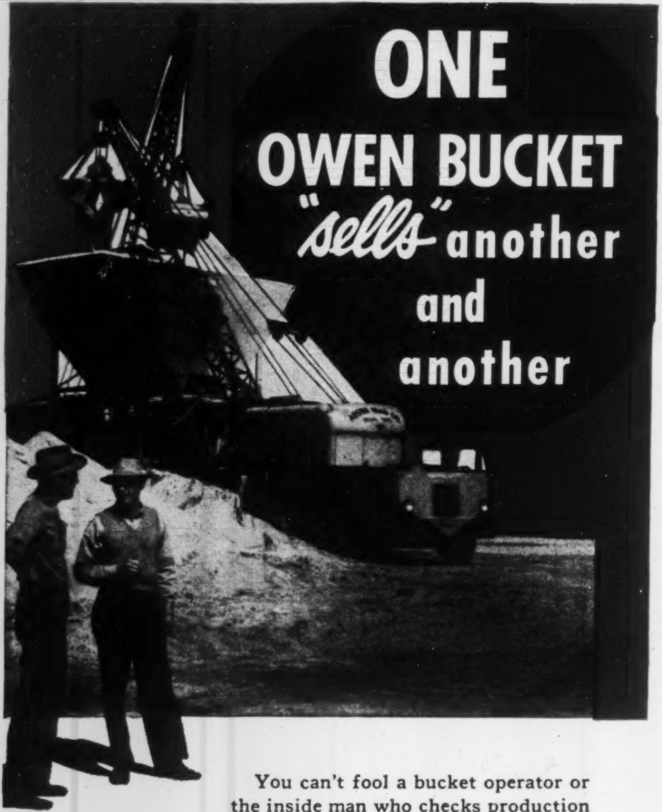
In addition to all these advantages, a one hour detention period gives the same results as 2 to 4 hours in the conventional type . . . *making for a more compact plant.*

For full information write to: The Permutit Company, Dpt. ENR-9, 330 W. 42nd Street, New York 36, N. Y. or to Permutit Co. of Canada, Ltd., 6975 Jeanne Mance St., Montreal.

P.S. Don't forget that Permutit can also provide tailor-made equipment to convert old conventional settling basins to the modern sludge-blanket Precipitator.

WATER CONDITIONING HEADQUARTERS FOR 40 YEARS

PERMUTIT®



You can't fool a bucket operator or the inside man who checks production records and OKs upkeep bills. That's why the first Owen Bucket generally leads to the purchase of additional Owen Buckets.

High production is literally visible to the eye at each grab and low maintenance costs are apparent by the absence or infrequent appearance of repair bills.

Based on repeat order records we say—"Buy your first Owen Bucket and it is more than likely that Owens will become your 'standard' thereafter."

BUCKETS AND GRAPPLES

THE OWEN BUCKET CO.

[illegible] Breakwater Avenue • Cleveland, Ohio

[illegible]

Juan, Puerto Rico, a public improvements program is being financed by the sale of a bond issue of $6,300,000. The following projects are included: Construction and improvement of 100 streets; a public works center; and a sewage disposal plant.

- **Italian cement factories**—In 1953 the output of Italian cement works is expected to rise to nearly nine million tons. The largest of the new cement works begun this year are those of Bagnoli and Catania. The new works, by using the slag from nearby steel mills, will be able to produce with half the amount of coal needed in the usual portland cement works.

- **To buy road machinery**—Prosperous Guatemala has just appropriated additional funds of $3,600,000 to buy highway construction machinery, cement and other construction material for use on the projected 200-mi Atlantic Highway to connect the Caribbean part of Puerto Barrios and Guatemala City. A shipment of 2,000 tons of 20-in. cast iron pipe has just been received—the first of several such purchases from the United States to be used in the city of Guatemala for its new multi-million dollar water system.

Fellowships for foreign engineers—The International Road Federation has awarded six fellowships to foreign highway engineers for graduate study in U. S. universities for the 1952-3 academic year to cover tuition, incidentals, living and travel within the United States. The recipients are from the Union of South Africa, Ecuador, Chile, Philippines, Belgium and France. Candidates were chosen in cooperation with national road associations and public works departments of each of the countries.

Chilean road—The greatest concentration of road-building machinery in the history of South America is pushing north along the coast of Chile in the first phase of a government plan to modernize the southernmost 2,112 miles of the Pan American highway system. Working in shifts 20 hours a day, 2,500 men and $15 million worth of machinery are moving across mountains, deserts and rivers to build a modern highway. The 130 ft wide right-of-way provides for a 24 ft wide 2-strip concrete and asphalt road and will allow for a future third strip. No grade is above 7% and curves will permit a steady speed of 60 mph with safety.

Madras harbor work—A $12-million

SCHUSTER
QUALITY CONCRETE
HOWARD 320
GREEN BAY WIS

Ford BIG JOBS feature an overhead valve, Low-Friction Cargo King V-8 —145 h.p. (F-7) and 155 h.p. (F-8).

FORD TRUCK ECONOMY RUN

WISCONSIN
Report No. 11312

"I haul loads averaging 11 tons, yet my running costs are

Only $5\frac{1}{10}$¢ a mile"

says Ed Schuster, Green Bay, Wisconsin

"I operate a number of trucks," says Mr. Schuster, "and our Ford tandem conversions have done a remarkable job. We have lots of power and gas mileage is above average. We are well satisfied." This F-7 with special dual drive axle traveled 14,494 miles in the Economy Run. Costs for gas, oil and maintenance were $738.87, or only 5.1 cents a mile!

Now! Up to 14% more Gas Savings

NEW
LOW-FRICTION
NEW
HIGH COMPRESSION
NEW
OVERHEAD VALVES

Two years of testing show how well the new Ford Low-Friction engines perform under the most severe conditions. They passed scores of 100-hour "destruction" tests. One model alone ran as much as 50,000 dynamometer test-hours, over 500,000 vehicle test-miles.

and more Speed Hauling power, too!

New Low-Friction design in 3 new Ford Truck high-compression engines cuts friction loss!

Ford's Low-Friction design cuts friction power loss up to 30%! A new Short-Stroke principle reduces piston travel up to 20% —makes for longer engine life. New Overhead Valves give more efficient fuel-feeding. New High-Compression gives extra power on regular grade gasoline.

You can get new Low-Friction design in 3 of the 5 great Ford Truck engines for '52. And you get more power than ever in the famous 239 cu. in. truck V-8 or the 254 cu. in. Big Six. See what's new in trucks at your Ford Dealer's!

DON'T GUESS! See how little it can cost to run a truck in your kind of work. See the cost figures in this 144-page book showing results from the 50-million-mile Ford Truck Economy Run. See it at your Ford Dealer's!

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50 MILLION MILE
FORD TRUCK
ECONOMY RUN
A guide to lower truck running costs

Availability of equipment, accessories and trim as illustrated is dependent on material supply conditions!

FORD TRUCKING COSTS LESS

and FORD TRUCKS LAST LONGER!

Using latest registration data on 8,069,000 trucks, life insurance experts prove Ford Trucks last longer!

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Please send me without charge or obligation, complete details on the new Ford Trucks for '52 and the five great Ford Truck engines!

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LIGHT MODELS ☐ EXTRA HEAVY-DUTY MODELS ☐

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For top belt-conveyor efficiency, top construction men rely on LINK-BELT

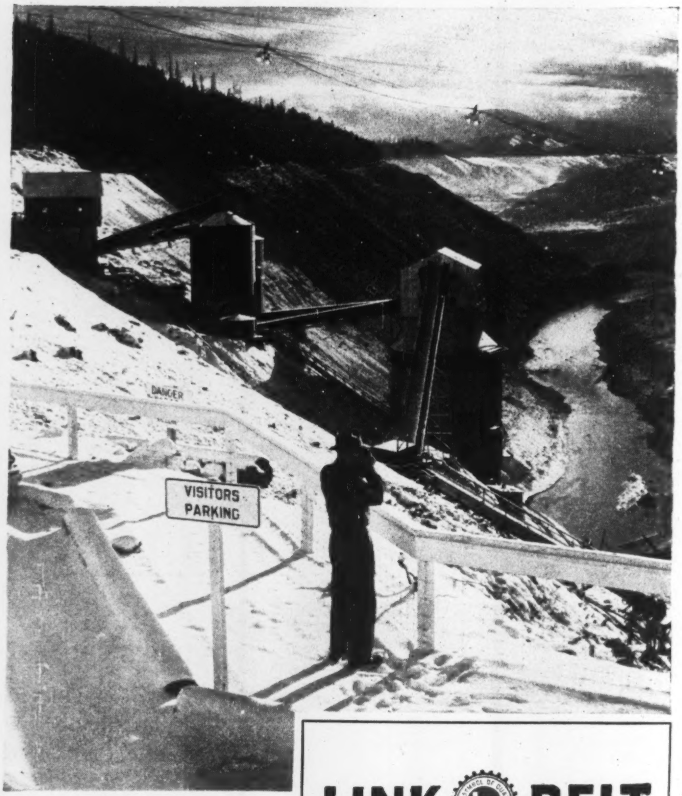
LINK-BELT engineering experience plus quality components combine to cut handling costs

Yes, on construction jobs everywhere, Link-Belt is first choice in belt conveyors. Whether your job is large or small, Link-Belt can apply unequalled engineering experience to meet the conditions of your particular system.

Link-Belt builds a complete line of quality components. Our conveyor engineers can choose from all types and sizes of idlers, trippers and terminal machinery to match your exact requirements.

Link-Belt can also supply all related equipment — other types of conveyors, feeders, elevators, car dumpers and shakers. And Link-Belt will build your supporting structures and enclosures . . . install the job completely if desired.

Link-Belt will gladly work with your engineers or consultants. Get in touch with your nearest Link-Belt office.



At Hungry Horse Dam, L-B belt conveyors at right carry sand and sized aggregate up mountainside to concrete mixing tower. Cement and pozzolan arrive by L-B belt conveyors from loading dock and silos at left.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices in Principal Cities.

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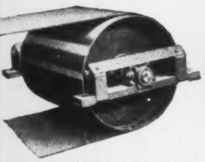
LINK-BELT

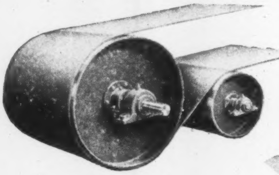
BELT CONVEYOR EQUIPMENT

LINK-BELT Pre-Selected Terminals—the right equipment for every requirement

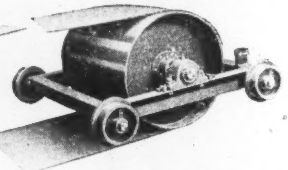
Terminal with single pulley drive



Terminal with screw take-up



Terminal with snubbed pulley drive



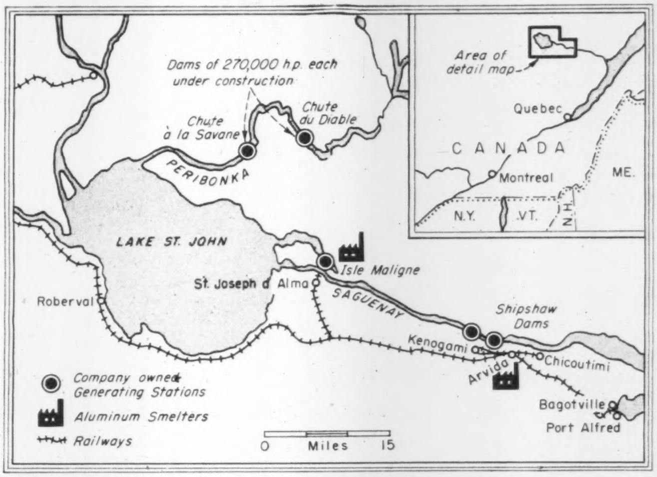
Terminal with counterweighted take-up

scheme for the expansion of the harbor of Madras, India, is now under way. Berthing will be increased from 9 to 11 ships. The acquisition of the necessary land for the expansion has been completed.

Jerusalem's convention center—A new accoustical system devised by a team of Israeli experts will be a feature of the 3,500-seat main hall of Jerusalem's convention center now under construction. The system consists of drilled woodboard walls behind which there are irregular concrete sheets at a distance averaging about one meter. Bott, Beranek and Newman, Boston, Mass., who handled the accoustics of the U N Headquarters in New York, have approved the system.

Philippine airports and highways—Work has begun on a new airfield at Cauayan in the Philippines which will have a 3,280-ft runway capable of taking 6-47 aircraft. Meanwhile, repair work is in progress at the Jolo, Tuguegaro, Cagayan de Oro and Tagbilaran airfields; and the taxiway and apron at the Manila International Airport are being strengthened to take heavier types of planes. The U. S. Mutual Security Agency has earmarked $6 million for highway development in the Philippines. The Philippine government will contribute two million dollars to the road project, mostly on Mindanao Island.

New Alcan hydroelectric plant is opened in Quebec



NEW SOURCE of Canadian Power in the Province of Quebec.

The Aluminum Co. of Canada is the world's largest and lowest-cost producer of primary aluminum ingot. With its parent company, Aluminum Limited, Montreal, it also owns and operates North America's second largest hydroelectric development: the 2.1-million hp. Saguenay Valley power system in Quebec.

Last week, Alcan opened up the first of 10 new 54,000-hp. generators being installed on the Peribonka River (about 400 miles northeast of Montreal), which will boost output from the Saguenay power system 25 percent. The Peribonka ("river that digs bed in the sand") races down about 200 miles from its headwaters above the 50th parallel into huge Lake St. John, from which the Saguenay itself flows into the St. Lawrence River.

The new Peribonka power will enable Alcan to (1) run its four Quebec aluminum smelters at full capacity (496,000 tons per annum) this year without buying outside power for the first time; and (2) boost total capacity to 550,000 tons in 1953.

HERE'S ALL YOU NEED TO CUT, SPLICE AND INSTALL THIS
LABYRINTH WATERSTOP!

Just a hammer and a knife . . . and you're in business. Nail flexible, polyvinyl Labyrinth Waterstop to the wall—*inside* your form—and forget about water seepage between concrete pours. Here's a real time, trouble and money saver.

- ***No Special Forms needed since no fins protrude into new pour.***
- ***No Metal Fins to tear or bend out of place.***
- ***No Welding or Vulcanizing expense. A hot knife joins sections in two or three minutes.***
- ***No Maintenance. Polyvinyl lasts indefinitely, resists temperature changes and chemical action of concrete.***
- ***For further information—clip coupon!***

Labyrinth Waterstop
The first really satisfactory water seal—eliminates seepage problems, simplifies form work.

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Chicago 6, Illinois

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Please send further information on LABYRINTH WATERSTOPS

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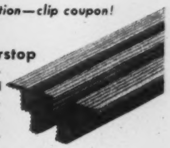


Fleets of BIG

Three B-Type Scrapers on construction of new railroad yard in Alabama.

are cutting dirt-moving costs

EVER notice how many Big Red Teams there are working in *fleets?* One of these Bucyrus-Erie Scraper and International TD-24 Tractor combinations sells another — and another, and another. Such repeat orders placed by satisfied owners are the best possible endorsement.

Why not do as others have — arrange for competitive tests between the Big Red Team and any other dirt moving combination? You will see for yourself that B-type Scrapers *load faster,* in *shorter distance* — that they get *bigger loads* with or without pushers — that they *haul more dirt, move it cheaper.* Ask your International Industrial Tractor Distributor for details. 16T52C

BUCYRUS-ERIE CO., South Milwaukee, Wisconsin

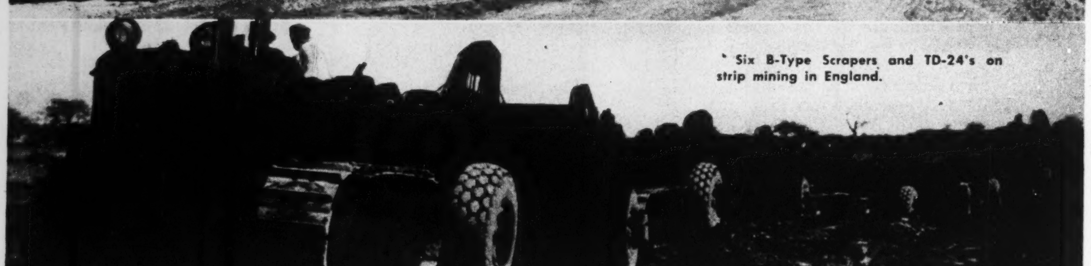
B-250

Scrapers—22 yd. (struck measure)

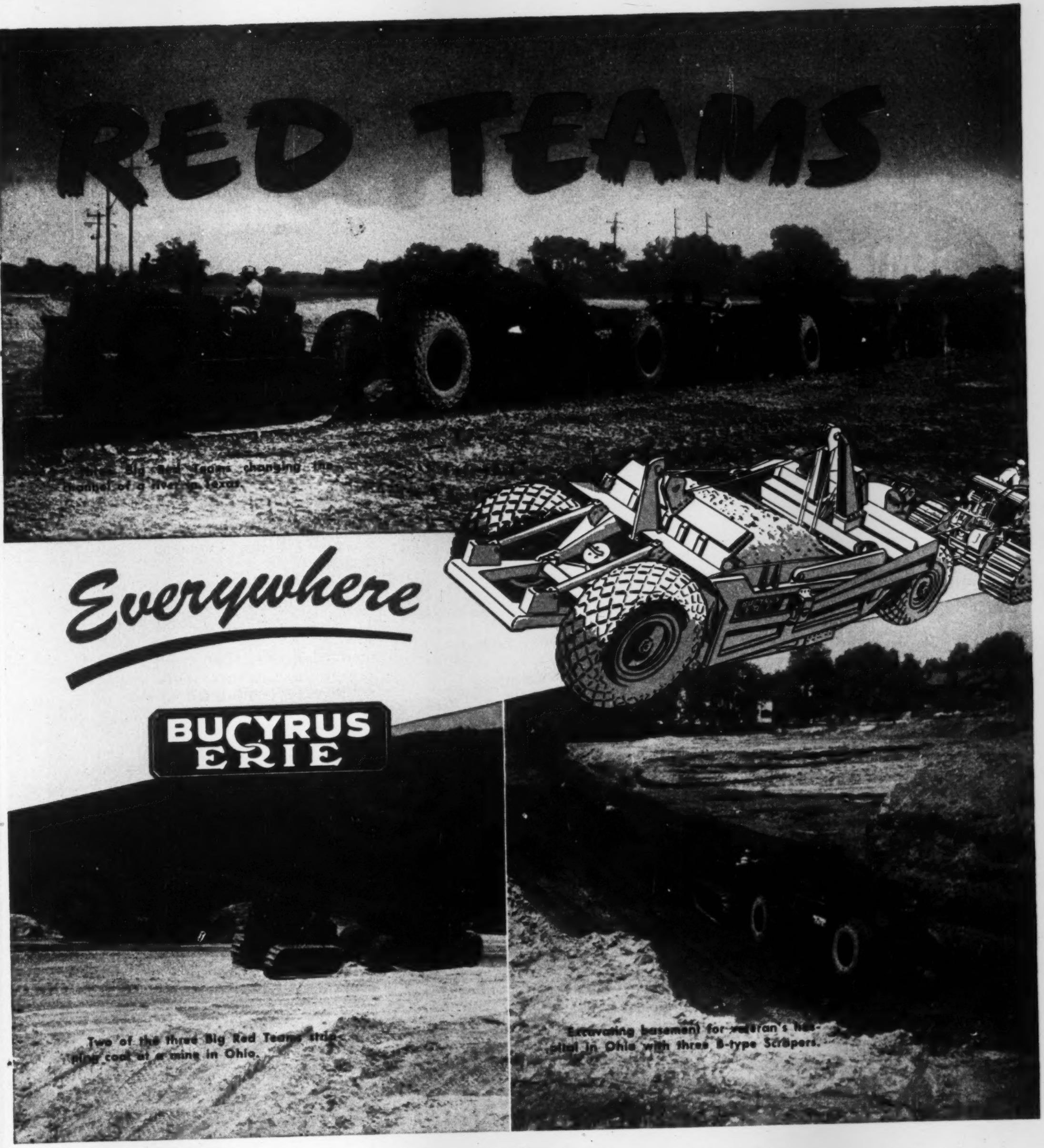
B-170A

Scrapers—16 yd. (struck measure)

Five Bucyrus-Erie B-250 Scrapers excavating at steam plant site in Tennessee.



Six B-Type Scrapers and TD-24's on strip mining in England.


RED TEAMS
Everywhere
BUCYRUS ERIE

Three Big Red Teams changing the channel of a river in Texas.

Two of the three Big Red Teams stripping coal at a mine in Ohio.

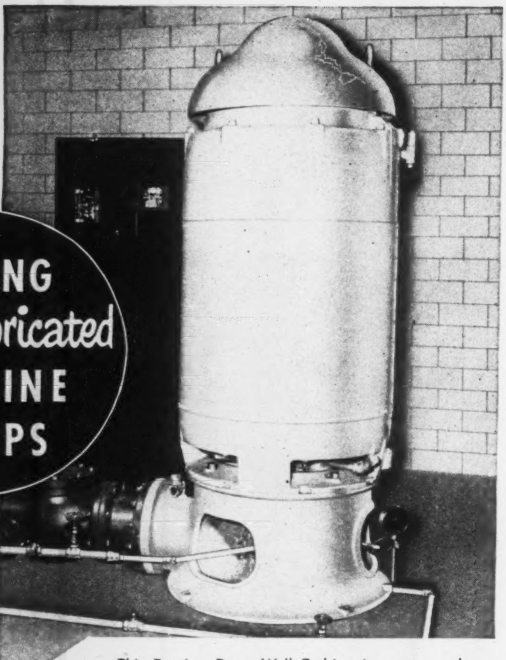
Excavating basement for veteran's hospital in Ohio with three B-type Scrapers.

BUCYRUS ERIE

See Your

INTERNATIONAL
Industrial Tractor
Distributor

DEMING
Water Lubricated
TURBINE
PUMPS



This Deming Deep Well Turbine in water works service has a capacity of 1150 G.P.M. at 550 Ft. total head with 200 H.P. motor.

Adaptable TO A WIDE RANGE OF APPLICATIONS

There are three principal components in Deming Vertical Turbine pumps. These are the Drive Assembly, the Column and Shaft Assembly, and the Bowl Assembly.

Those three principal components are manufactured in a wide range of standard sizes for quick assembly into almost unlimited combinations to meet specific conditions.

Unit drive head is furnished where electric power is available. Auxiliary drives are available to meet various requirements.

Pumps are designed for wells 4" to 16" or larger in a full range of capacities from 15 to over 3500 G.P.M.

For dependable, low cost operation and maintenance in water works pumping service, *Specify Deming Vertical Turbine Pumps.*

THE DEMING COMPANY • 536 Broadway • Salem, Ohio

DEMING
VERTICAL
TURBINE PUMPS

Write for Bulletin No. 4700 which gives you detailed information about Deming Vertical Turbine Pumps.

Deming
DEPENDABLE PUMPS

INTERNATIONAL

Five of the new generators on the Peribonka are at Chute-Du-Diable, where construction began in November, 1950; the others, 14 miles downstream at Chute-A-La-Savane, begun May, 1951. Electricity will start flowing from Chute-Du-Diable's four other generators at three-week intervals Savane will deliver power early next year.

The new generators are not housed in conventional buildings. They are being lowered into the concrete of the dams themselves. Chute-Du-Diable required excavation of 673,000 cu. yds. of rock and the pouring of 343,000 cu. yd. of concrete. Its turbines were manufactured by Canadian Allis-Chalmers and generators by Canadian Westinghouse.

At Savane, 535,000 cu. yd. of rock were dug out and 391,000 cu. yd. of concrete poured. Turbines are being manufactured by the Dominion Engineering Works, Ltd., and the generators by the Canadian General Electric.

Seven thousand workmen were employed to build Alcan's two new power projects. A 25-mile highway had to be built through timber-studded country from the nearest village to the dam sites. Then an entire community was erected for the construction gangs.

Work goes on around the clock throughout the year, though winter temperatures on the Peribonka drop to 40 degrees below zero.

Cost of Alcan's power expansion in the Saguenay valley is about $120-million. Primarily because it generates its own electricity, Alcan's aluminum production costs are from 2 to 4 cents a lb. below those of Alcoa, Kaiser, and Reynolds. It takes nearly 10 kilowatt hours to make one lb. of aluminum. Saguenay power costs Alcan slightly less than one-tenth of a cent per kilowatt hour. U. S. aluminum producers' costs are at least twice as high.

Alcan now sells about 15 percent of its Saguenay power output. The Saguenay system includes five dams and three powerhouses (Isle Maligne, built 1925, capacity 540,000 hp.; Shipsaw No. 1, 1932, 300,000 hp.; Shipshaw No. 2, 1943, 1.2 million hp.).

Japan studies 325-mile freeway

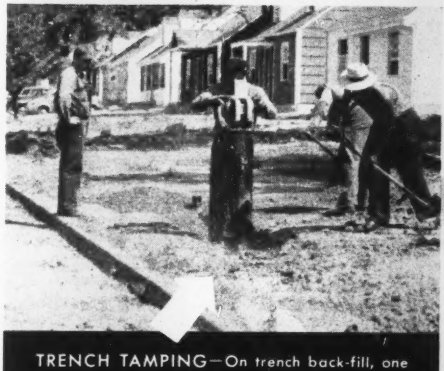
If present plans materialize, including aid from U. S. financing, Japan will have one of the most remarkable super highways in the world. It would

Figure your costs with BARCO for the "low bid" on any job!

SOIL COMPACTION JOBS no longer need present problems. With Barco Rammers, progressive contractors throughout the Nation are finding that specifications calling for 95% to 97.5% compaction represent opportunities for profitable work. FOR THE LOW BID ON ANY JOB, FIGURE YOUR COSTS WITH BARCO!

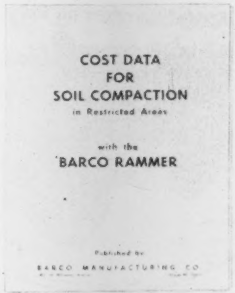
See for yourself; ask for a demonstration. *Worldwide Sales and Service.* BARCO MANUFACTURING COMPANY, 1814K Winnemac Avenue, Chicago 40, Illinois. *In Canada:* The Holden Co., Ltd., Montreal, Canada.

AREA TAMPING—On high degree specified compaction with 12" to 20" lifts, the Barco Rammer will cover from 1 to 1½ square yards of surface per minute. This means 20 to 30 cu. yds. of fill per hour, or 160 to 240 cu. yds. per 8 hr. day per Rammer.



TRENCH TAMPING—On trench back-fill, one Barco Rammer will tamp a trench 18" wide at the rate of 6 to 10 feet per minute or 360 to 600 feet per hour. Depending on soil conditions, lifts up to 24" may be used.

Write for this "COST DATA" Bulletin



COST DATA
FOR
SOIL COMPACTION
in Restricted Areas

with the
BARCO RAMMER

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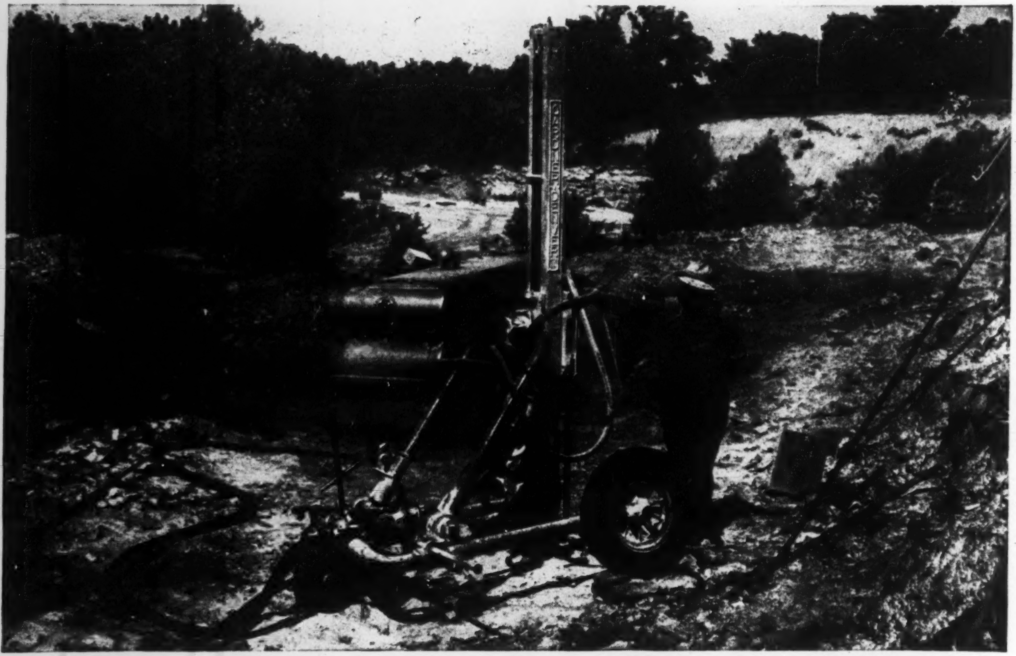
For Soil Compaction Close to Walls, Culverts and Abutments — in Trenches, Ditches

FREE ENTERPRISE — THE CORNERSTONE OF AMERICAN PROSPERITY



The Shortest Distance Between Two Profit Points

Your air hose spans two profit-making points when you choose Gardner-Denver Portable Compressors and Wagon Drills for your heavy drilling jobs. You compress air for less and use it more efficiently—and you pick up extra savings at both ends of your air hose.

YOU GET DEPENDABLE COMPRESSED AIR FOR LESS WITH GARDNER-DENVER WATER-COOLED PORTABLES

- Fully water-cooled compressor cylinders assure proper lubrication in cold weather—cooler operation in hot weather.
- Two-stage compression delivers full capacity at any altitude.
- High efficiency air cleaners protect against wear.
- Deep oil sumps in engine and compressor provide positive lubrication on hills.

YOU DRILL HIGH FOOTAGE EFFICIENTLY WITH GARDNER-DENVER WAGON DRILLS

- Very flexible — easily adjusted for faster hole spotting.
- Handy controls enable the operator to drill more efficiently.
- Powerful automatic blowing keeps the deepest holes clean—encourages more frequent cleaning for faster drilling.
- Long steel changes reduce steel handling time.
- Write for further information.

SINCE 1859

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois

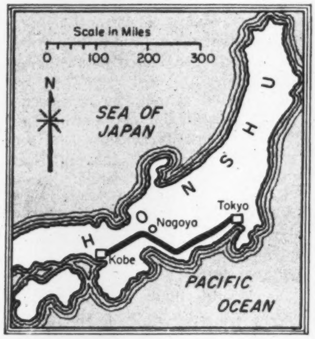
In Canada: Gardner-Denver Company (Canada), Ltd., Toronto, Ontario

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

extend from Tokyo to Kobe, a distance of 325 miles. It would pass through an area that accounts for more than half of the nation's total production and would directly benefit an estimated 30% of the country's population.

From a construction standpoint it would traverse rugged terrain, intensively cultivated valleys and plains and many densely populated communities. Preliminary estimates indicate it will require 41,300 ft of bridges and 110,000 ft of tunnels. Excavation in cuts would approach 36,000,000 cu yd, and over 100,000,000 cu yd of fill would be required.

These data are from a report to Uichi Noda, minister of construction, made at his request by C. H. Cotter, vice-president, Blythe Brothers Co., construction contractors of Charlotte, N. C. Admiral Cotter, commander of the Seabees in the Pacific during the war, studied the project and examined the proposed route for several weeks last Spring.



The report recommends the establishment of a Freeway Authority, empowered to borrow money on the faith and credit of the government, to enter into contracts and to construct and operate a high-speed, limited access highway, safe and durable but without any unnecessary frills. A five-year construction period to be devoted to this project is envisioned.

Based on present prices the estimated cost is set at $357,000,000, of which $47 million would be interest, the rest construction. Nearly $40 million would be required to purchase construction equipment.

It is understood that a prospectus on the proposed freeway is now being prepared by the Japanese government as a preliminary to a loan request. Whether this will be made to private investors or to such agencies as the Export-Import Bank or the World Bank has not been determined up to this time.

SOUND CONSTRUCTION CALLS FOR NELWELD FASTENINGS

SPECIFY NELWELD FOR:

INDUSTRIAL ROOFING AND SIDING
Corrugated Steel, Aluminum, Asbestos—Curtain Walls
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INSULATION MATERIALS
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WIREWAYS
SPRINKLER SYSTEMS

END-WELDS FASTENER STUDS TO STEEL IN A SPLIT SECOND... AN ELECTRIC ARC WELDING PROCESS

FAST, EASY INSTALLATION
PERMANENT FASTENING
BETTER FINISHED APPEARANCE
LOW MAINTENANCE COSTS

Nelson Construction fasteners are distributed by United States Steel Supply, Reynolds Metals Co., Aluminum Company of America, Johns-Manville, Philip Carey Mfg. Co., Armstrong Cork Co., Southern States Iron Roofing Co.

Write for your copy of the Nelweld Construction Application Manual

Fasten it Better... at Less Cost, with NELWELD

NELSON STUD WELDING

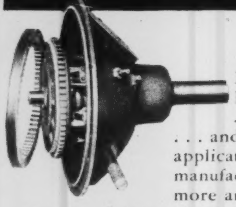
DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

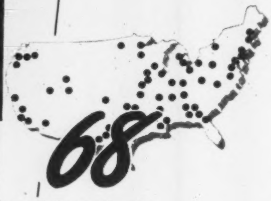
**Cut Downtime . . .
Step up Worktime**

More Friction Power Take-Offs . . . in more sizes . . . and in more fields of application than any other manufacturer. That's why more and more manufacturers and users of powered equipment are standardizing on Twin Disc Power Take-Offs.

Standardization on Twin Disc drives is a profit-making practice because it assures you (1) long work life; (2) ready availability of parts and services; (3) interchangeability of parts; (4) advantage of specialized "know how" by repair departments; (5) minimum parts inventory requirements.

Increased manufacturing facilities at Twin Disc assure you of quick delivery of both complete drive units and replacement parts. Complete parts stocks at 8 factory branches and 60 parts stations—which are staffed by service experts—bring quick service near to you.





68

8 Factory Branches and 60 Parts Stations strategically located.

$3¼ MILLION

$3¼ million of service parts and complete replacement units carried in inventory.

Built for a Long Life . . .
Backed for a Lifetime

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
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BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA

U. S. capital is flowing into Latin America

In recent years Latin America has become very important as a field for United States foreign investment. Dollar investments have flowed in that direction since World War II at an unprecedented rate.

At the end of 1950 our direct private investments there were about $6-billion. Exclusive of Canada, this is more than half the total of U.S. private investment abroad.

The loan programs of the Export-Import Bank were begun in 1939 for the financing of transportation needs, highways and other vital aspects of national development. Since the war the World Bank also has been operating in this field. Other activities, much involving construction, have been carried on by our Public Health Service and the Department of Agriculture.

Countries which have benefited especially from our cooperation, with collateral benefits to our own economy, are Chile, Venezuela and Brazil.

- **Chile**—The largest single loan to Chile by our Export-Import Bank—$58 million—was for the construction of a steel mill near Concepcion, the current production of which is about 300,000 tons of steel ingots a year. The World Bank has granted an initial credit for work in the location of ground water resources in the Rio Elqui Valley. The U.S. Bureau of Reclamation has assigned technicians to assist in this project expected to relieve food shortages in the arid northern part of the country.

As a result of cooperation involving the Chilean government, U.S. private capital, and the two banks, the Santiago-Valparaiso region tripled its consumption of electric power between 1936 and 1951, with additional expansion now under way.

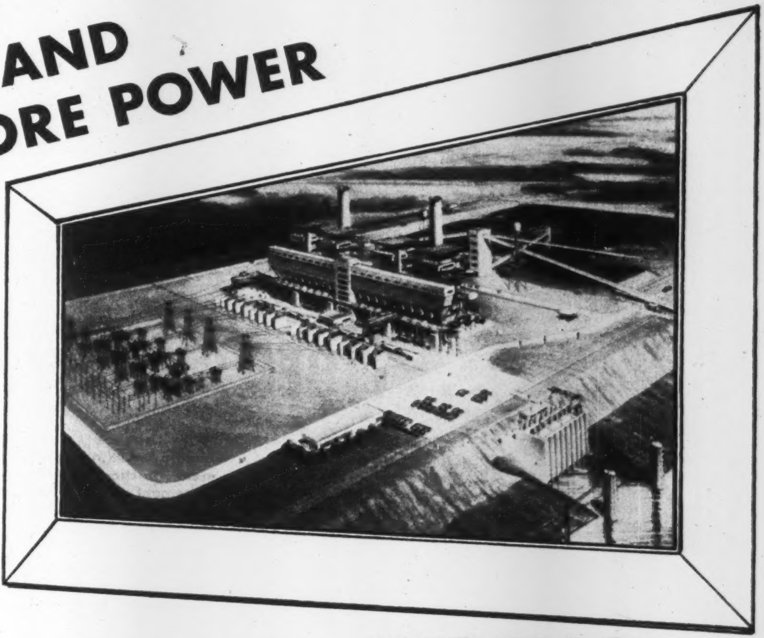
The United States has provided assistance in the construction of sewerage and water supply systems, hospitals and health centers.

- **Brazil**—In Brazil the outstanding example of our Export-Import Bank loan assistance is the Volta Redonda steel mill which today has a capacity of 450,000 tons of steel ingots. This will be increased to about 680,000 tons with the proceeds of an additional loan made last year.

These loans bring the total of financial assistance to Brazil by the two banks to $425 million.

- **Venezuela**—In Venezuela is seen a good example of the role which private enterprise can play in the develop-

POWER AND MORE POWER



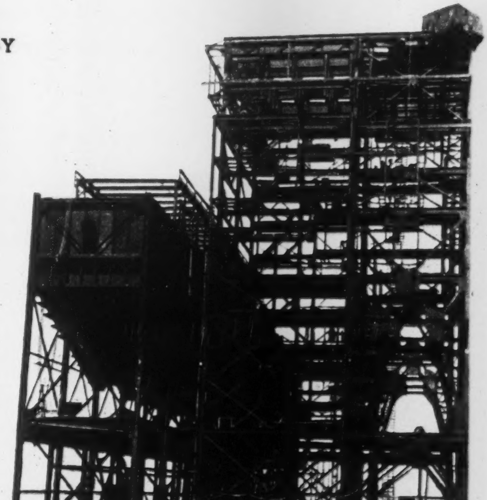
fabricated and erected by **INGALLS**

The huge Electric Energy, Inc. power plant at Joppa, Illinois, being constructed by Ebasco Services, Inc., is unlike any of the many generating stations for which Ingalls has fabricated and erected the steel. Gargantuan in size, the Joppa steam plant is unique!

Whether it's a gigantic power plant on the Ohio river, an office building in New Orleans or an apartment building in New York, Ingalls has the fabricating capacity and experience to do a bang-up job efficiently and economically.

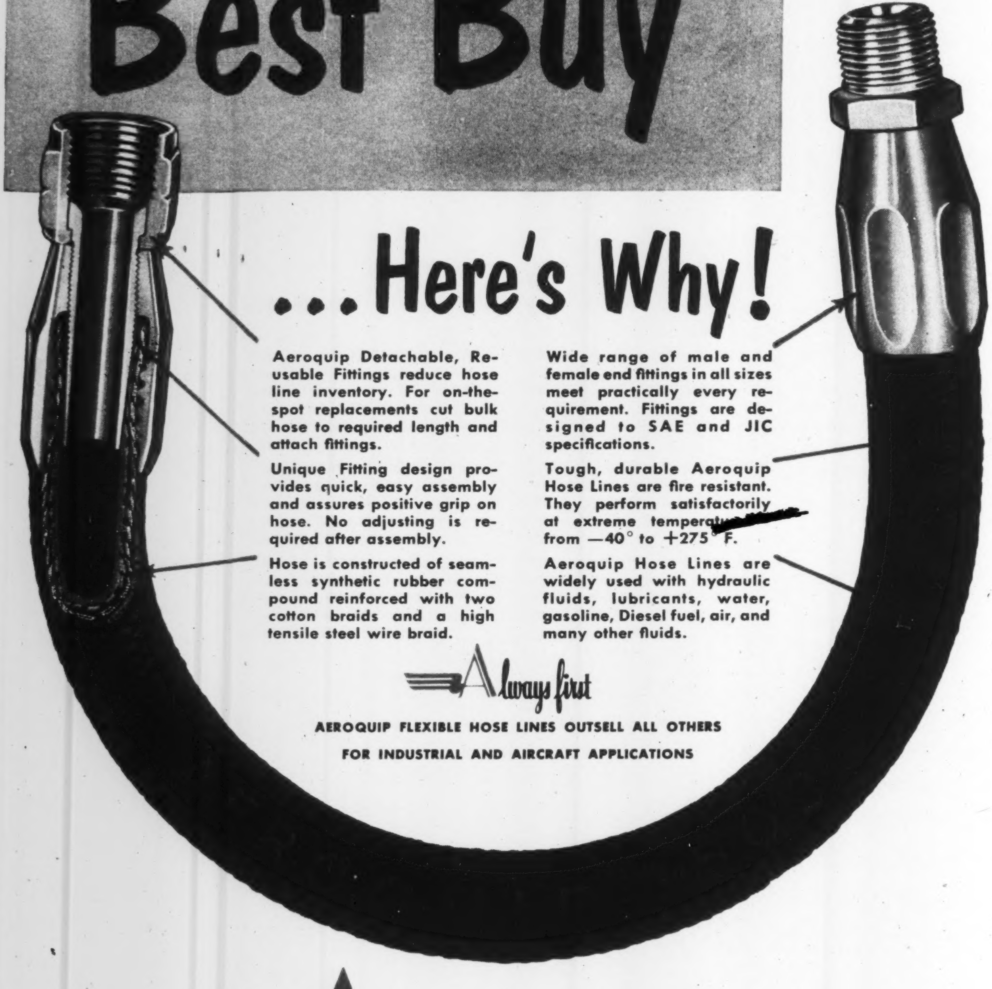
THE INGALLS IRON WORKS COMPANY
BIRMINGHAM, ALABAMA
Sales Offices: New York, Chicago, Pittsburgh

Plants: Birmingham, Ala., Verona, Pa.,
North Birmingham, Ala., Pascagoula, Miss., Decatur, Ala.



Best Buy

...Here's Why!



Aeroquip Detachable, Reusable Fittings reduce hose line inventory. For on-the-spot replacements cut bulk hose to required length and attach fittings.

Unique Fitting design provides quick, easy assembly and assures positive grip on hose. No adjusting is required after assembly.

Hose is constructed of seamless synthetic rubber compound reinforced with two cotton braids and a high tensile steel wire braid.

Wide range of male and female end fittings in all sizes meet practically every requirement. Fittings are designed to SAE and JIC specifications.

Tough, durable Aeroquip Hose Lines are fire resistant. They perform satisfactorily at extreme temperat[illegible] from —40° to +275° F.

Aeroquip Hose Lines are widely used with hydraulic fluids, lubricants, water, gasoline, Diesel fuel, air, and many other fluids.

Always first

AEROQUIP FLEXIBLE HOSE LINES OUTSELL ALL OTHERS
FOR INDUSTRIAL AND AIRCRAFT APPLICATIONS

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AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

ment of a country. The economic cooperation involved in using private capital and technical skill from the United States has brought about an almost unparalleled record of economic and social advancement. Our business men have invested $2.5 billion in Venezuela, which is now second only to the United States in oil production. At the Bolivar coastal field alone on Lake Maracaibo 4,000 wells in one concentrated area every day bring into world commerce more than 700,000 bbl. of crude oil.

Venezuela has made use of its mounting oil income to build roads, hospitals and other public works and to promote agriculture, education and public health projects.

A number of United States engineering and construction companies are carrying out projects in Venezuela.

Foreign Items

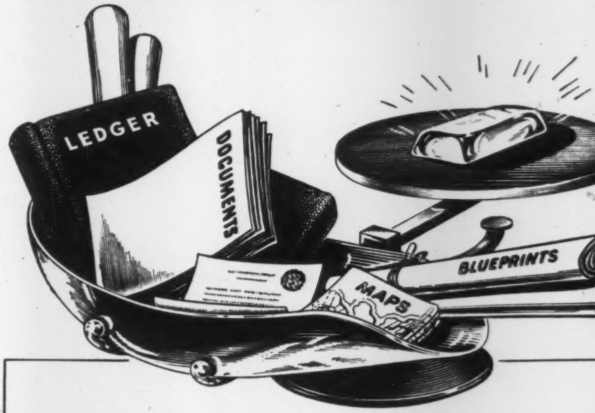
- **Negev Desert reclamation**—An agreement has been signed in New York between the Worthington Corp. of New Jersey and the Jewish Agency for Palestine which provides for the supplying of pipes, pumps and other equipment to the Mekoroth Water Co., which is engaged in the development of water resources in Israel and has recently started diversion of the Yarkon River to the Negev Desert as the first step toward opening the desert to 10,000 new settlers.

- **Puerto Rican housing plans**—Currently under discussion between the FHA and members of the Puerto Rico Housing Construction Association, private engineers, and contractors, are plans for a project of 20,000 concrete units, under the terms of Title I, Sect. 8, U. S. Housing Act, to cost about $60 million. The housing would be for low-income groups. The estimated price would be $3,000 per house, buyers to pay at the rate of from $18 to $20 a month.

- **Spanish reservoirs**—The reservoir capacity in Spain has doubled during the last 12 years. From 1940 till the end of April this year 36 new reservoirs have been constructed, increasing the country's water storage capacity by 2.58 million ac ft. The production of electric power in Spain is now well over two million kw. of which 817,000 kw is from thermo-electric plants.

- **Large contract**—When Sir John Allum, Mayor of Auckland, New Zealand, arrives in England, he will be authorized to accept the tender sub-

Worth more than their weight in gold



How important to the continued operation of your business are your mortgages, deeds, blue prints, books, maps, drawings, manuscripts? Worth more than their weight in gold to you, aren't they?

Suppose they disappeared mysteriously, were stolen, mutilated, destroyed by fire. Ever stop to realize what their loss would mean? —how much it would cost to replace them?

Protect yourself and your business. National Surety Corporation has just the safeguard you need. The Valuable Papers and Records Policy pays for the material and labor costs to replace them. *No other form of policy offers this broad protection.*

Telephone the NATIONAL SURETY representative in your community today for complete information and get the protection you need.

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Mixall
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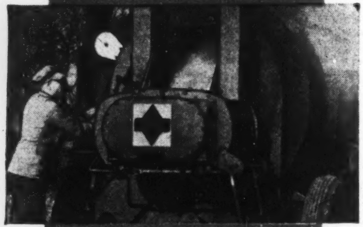


For parking lots, factory floors . . . on-the-job drying of aggregates, complete control of mix.

For playgrounds, tennis courts, roads and streets . . . scattered jobs . . . variations of mixes.

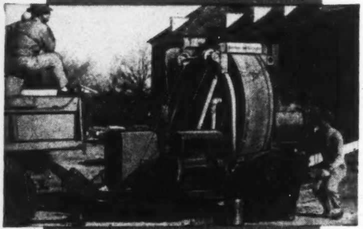
. . . THE NEW B-G *Mixall*

MIXES ALL THE HOT PATCH YOU NEED, ANY TIME, ANYWHERE, ANY WEATHER

Now, the new Barber-Greene Mixall gives you the opportunity to offer high quality bituminous paving for driveways, sidewalks, service stations, industrial plants, parking lots . . . and other "black top" jobs at new low costs.

The Mixall, a completely new, compact and portable small-job maintenance and paving mixer, will produce up to 5 t.p.h. of any type hot mix . . . up to 10 t.p.h. of cold mix . . . will produce low slump Portland cement mixes. Built to be towed behind the aggregate truck for on-the-spot mixing, the Mixall is just as well suited for central plant or stock pile operation. The Mixall can work in any weather . . . even drying frozen aggregates.

Think of what you could do with the new B-G Mixall in your territory. Then see the Mixall at your first opportunity . . . or write for full information.



No setup time with Mixall. Operate it hitched to truck for drives, sidewalks, other small jobs.

THE ONLY SMALL JOB MAINTENANCE MIXER WITH...

- ROTARY DRUM DRYING: The same principle used in largest B-G Continuous Dryers.
- TWIN SHAFT HEATED PUGMILL: "Kneading" action assures even coating of every aggregate particle.
- POWER SKIP HOIST: Only 14" high for easy charging.
- HIGH DISCHARGE: Can discharge directly into place, into wheelbarrows or gas buggies.

"Stitch-in-time" maintenance prevents major break-ups; the Mixall works in any weather.

Resurfacing busy crossings, Mixall's compactness allows minimum traffic interference.

Barber-Greene

Aurora, Illinois, U. S. A.

mitted by two British firms, Dorman Long & Co. of Middlesbrough, and the Cleveland Bridge and Engineering Co. Ltd. of Darlington, for a 3,360-ft steel bridge across Auckland Harbor. The cost involved will be approximately $11.9 million. This will be the largest overseas contract secured by British structural engineers in postwar years.

CALENDAR

Pan American Union of Engineering Societies, 3d Congress, Tulane University, New Orleans, La., Aug. 25-30.

American Society of Civil Engineers, Centennial of Engineering, Conrad Hilton, LaSalle and Blackstone hotels, Chicago, Sept. 3-13.

Sept. 4—ENR's Annual Cost Issue

National Council of State Boards of Engineering Examiners, The Antlers Hotel, Colorado Springs, Colo., Sept. 4-6.

National conference on industrial hydraulics, annual meeting, Hotel Sherman, Chicago, Sept. 4-5.

International Congress and Exposition of Photogrammetry, Shoreham Hotel, Washington, D. C., Sept. 4-13 (and Bolling Air Force Base, Washington, Sept. 15-16).

N. J. Society of Professional Engineers, semi-annual meeting, Wanamassa, N. J., Sept. 6.

Institute of Traffic Engineers, Sherman Hotel, Chicago, Sept. 8-11.

N. Y. State County Superintendent's Association, Concord Hotel, Kiamesha Lake, Monticello, N. Y., Sept. 9-11.

National Constructors Association, Labor and Executive committees, Fairmont Hotel, San Francisco, Calif., Sept. 10-11.

American Concrete Institute, Conrad Hilton Hotel, Chicago, Sept. 10-12.

International Symposium on the Chemistry of Cement, London, England, Sept. 15-20.

American Institute of Steel Construction, annual convention, Empress Hotel, Victoria, B. C., Sept. 29-Oct. 2.

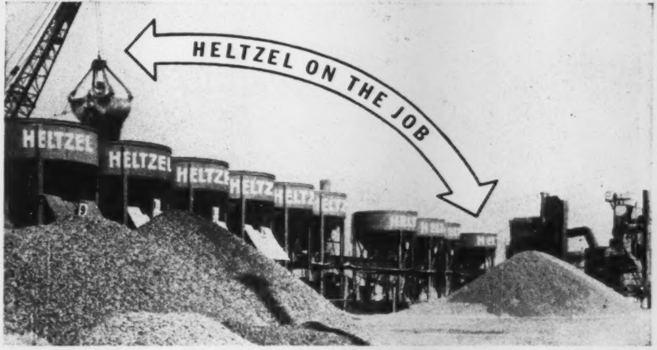
Federation of Sewage and Industrial Wastes Associations, Hotel Statler, New York City, Oct. 6-9.

President's Highway Conference, Chicago, Oct. 17-18.

California section, American Water Works Association, Huntington Hotel, Pasadena, Calif., Oct. 27-31.

Heltzel
BUILDS IT BETTER

HELTZEL HELPS
CONSTRUCTION DOLLARS
GO FURTHER



NASSAU DOCKS, INC.
REORDERS HELTZEL BINS
Often empties over
3 bins per hour

PROBLEM: To have overhead storage of 1½", ¾", ⅜" stone and run-of-crusher limestone screenings which are delivered in barges; to fill and empty the bins quickly into trucks having 14 to 16-yard capacity; to deliver aggregates in proper proportion from the same bins to an asphalt plant on a conveyor belt. These were the Nassau Docks, Inc., problems.

SOLUTION: Nassau Docks, Inc., ordered four 18-foot diameter, 150-ton capacity Heltzel bins, and at a later date, six more. A two and one-half yard clam-shell loads the bins. For discharging, double-acting clam-shell gates (16" x 16") operate from the ground level. During busy days at Nassau Docks, three or more bins are emptied per hour. The superintendent says that any one of 4 aggregates, or any combination of them, can be moved on the conveyor belt to the asphalt plant.

●Nassau Docks, Inc., furnishes aggregates for its own asphalt plant, for contractors and Hendrickson Brothers, with whom Nassau Docks is allied. Specialized Heltzel engineering features circular and square bins; 50-degree sloping sides of cone; a choice of clam-shell, single arc or roller gates ranging in size from 12" x 12" to 30" x 30" which are air or manually operated.

Ease of assembly is testified to by steel erectors time after time. Heltzel has solved hundreds of similar problems effectively; so why don't you write regarding your storage, loading, mixing, unloading, batching or materials handling problems?

Heltzel
BUILDS IT BETTER
The Heltzel Steel Form & Iron Company
Construction Equipment Since 1910
WARREN, OHIO
Flex-Plane

THE VICTAULIC® METHOD OF PIPING

EASIEST WAY TO MAKE ENDS MEET

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VICTAULIC

TEES . . . ELBOWS . . . REDUCERS . . . the Victaulic Method features a complete line of modern, top efficiency, Full-Flow Fittings for use with world famous Victaulic Couplings!

The Victaulic Method assures a complete, modern system of piping . . . fast, efficient hook-ups that simplify and streamline construction . . . cut costs! Victaulic Couplings offer easy-to-install, leak-proof connections . . . a union at every joint . . . assured trouble-free service under pressure or vacuum. Victaulic Full-Flow Fittings specially designed for use with Victaulic Couplings provide wide adaptability and complete versatility in construction. And to make the Victaulic Method complete—"Vic-Groover" Tools groove standard pipe easily and quickly . . . provide handy, portable equipment for preparing pipe right on the job!

Try the VICTAULIC METHOD on your next piping job. New construction . . . repairs . . . alterations—you'll find that the Victaulic Method *is the easiest way to make ends meet!*

Write today for Victaulic Catalog and Engineering Manual No. 44-8D.

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Export: Pipe Couplings. Inc., 30 Rockefeller Plaza, N. Y. 20, N. Y.

LEGAL

Profits are recoverable under construction contracts

A contract was entered into for the installation of fire extinguishing apparatus in a building for the sum of $243,614 which sum was to be paid in monthly installments of 85% of the price of materials delivered and work performed during the month preceding.

The contractor commenced the work and performed a substantial part of it when the owner of the building, having encountered financial difficulties, stopped the monthly payments. The contractor continued work for about ten months and then stopped performance.

When bankruptcy proceedings were instituted against the owner the contractor then filed a mechanic's lien against the property for the sum of $139,616 which was conceded to be the value of the work done. The contractor also filed a claim for $24,919, which he claimed represented the profits which he would have made if he had been permitted to complete the work.

The property was sold and in order to clear its title the contractor was paid the amount of his lien. The new owner then entered into a contract with the same contractor to complete the work. The claim for lost profits was rejected by the receivers on the grounds that the contractor made practically the same profits under the new contract that he would have made under the original contract, that he should not make the two profits on the same work, and that it was the duty of the contractor to do what he could to minimize the damages after the breach occurred.

The Circuit Court of Appeals reversed this judgment, holding that the contractor was entitled to recover the profits lost by being prevented from performing the original contract.[1] "To deprive him of it, when the other party has broken the contract and unlawfully put an end to the work, would be unjust."

The court, in discussing the question as to the right to apply the profits made on the other contract in reduction of damages, stated: "In contracts for personal services the rule invoked by the receivers is applicable. In such contracts it is the duty of the plaintiff to use every reasonable effort and proper opportunity to secure another contract in order to mitigate the damages caused by the breach because the plaintiff's services are in

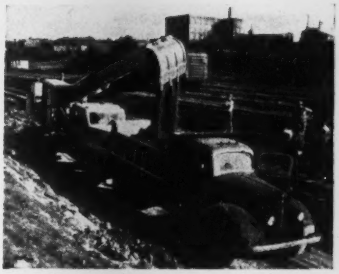
No "Elbow Room"...

BUT ROOM FOR GRADALL'S FAMOUS ARM-ACTION!

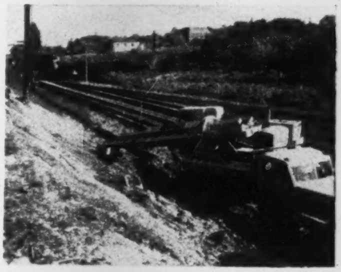
GRADALL CONTRACTORS are often called on for many unusual jobs. And a Cleveland contractor, James Murphy & Sons, recently took on this tricky railroad job that required working in an area not much wider than the truck itself. On one side was a cut that had to be trimmed. On the other, a busy main line track where traffic had to be maintained.

But the Gradall's unique *arm-action* and *controlled down pressure* did the job fast—and better than the hand labor and machines it replaced. Working from the top of the bank—around posts and other obstacles—it first trimmed the top part of the slope. Then, backed into the narrow passageway, its hydraulic-telescoping boom "reached out" to finish the slope's lower portion, as well as digging a drainage ditch and cleaning the roadbed right up to the ties—all from this cramped position—with no hand labor.

The multi-purpose Gradall is one machine you're sure to keep busy on all sorts of earth-moving and construction jobs. For a field demonstration of its cost-cutting efficiency, see your nearest Gradall Distributor.



Gradall's 360° mount and telescoping boom permitted loading spoil over cab into waiting truck, necessitated here by one-way approach to work area.



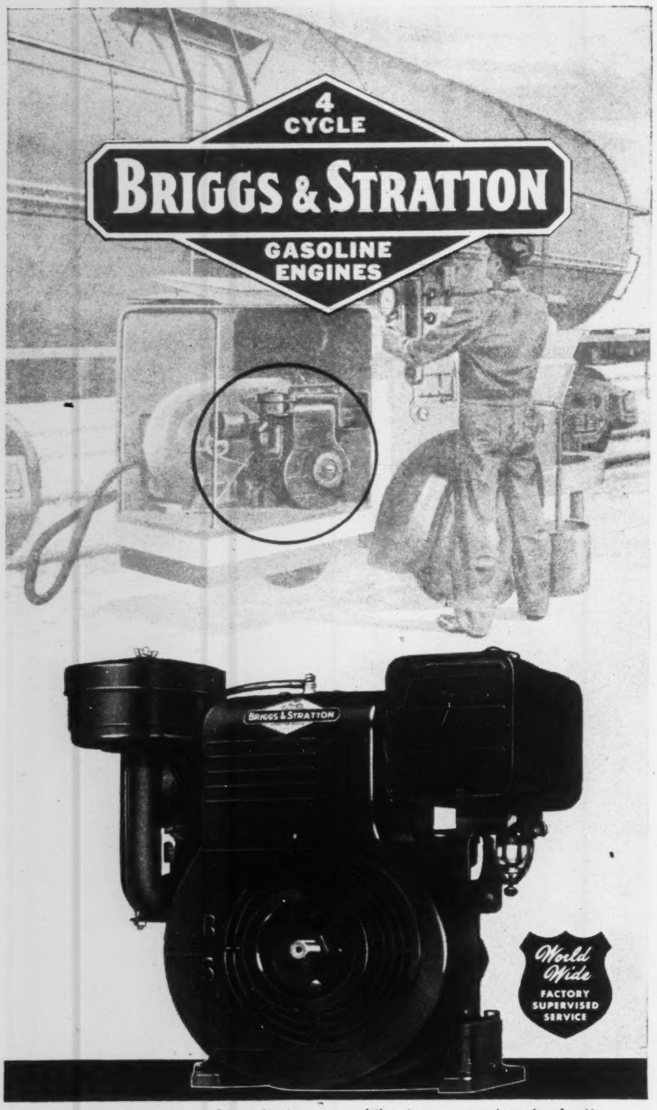
Hydraulic arm-action boom tilts bucket to work at any angle.

Note accurate, uniform grade of finished slope and close work around ties—without hand labor.

Gradall Distributors in over 75 principal cities in the United States and Canada

Gradall® DIVISION OF WARNER & SWASEY Cleveland

GRADALL—THE *Multi-Purpose* EARTH—MOVING AND CONSTRUCTION MACHINE



Preferred power on tank-car heaters or mobile steam generators for heating tank-cars of road oil and bitumen — the world's most widely used single-cylinder gasoline engines on machines and equipment for the construction industry, railroads, oil-fields, and for farms and farm homes.

Whether you build, sell, or use gasoline-engine powered equipment — you are assured of maximum performance and foremost value when the power is a Briggs & Stratton single-cylinder, 4-cycle, air-cooled gasoline engine.

Briggs & Stratton Corporation,
Milwaukee 1, Wisconsin, U.S.A.

In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.

his possession. They are his own and he can dispose of them as he pleases.

"But a different rule of law is applicable in manufacturing contracts and contracts for specific work where personal services are not involved and the subject-matter of the contract is not in the possession of the plaintiff. There are decisions to the contrary, but we think that sound reason, wise business policy, and the weight of authority do not require the plaintiff to enter into other contracts, assume the risk, use his skill, and employ his capital for the benefit of the defendant whose fault caused the damage. The law either does or does not require the plaintiff to do so. It would not be just to give the defendant the benefit of a good contract and not charge him with the loss of a bad one when plaintiff had honestly used his skill, time and capital. Consequently on the breach of such contracts, the defendant is not entitled to the benefit of any other contract into which the plaintiff may enter within the period it would ordinarily require for the performance of the breached contract."

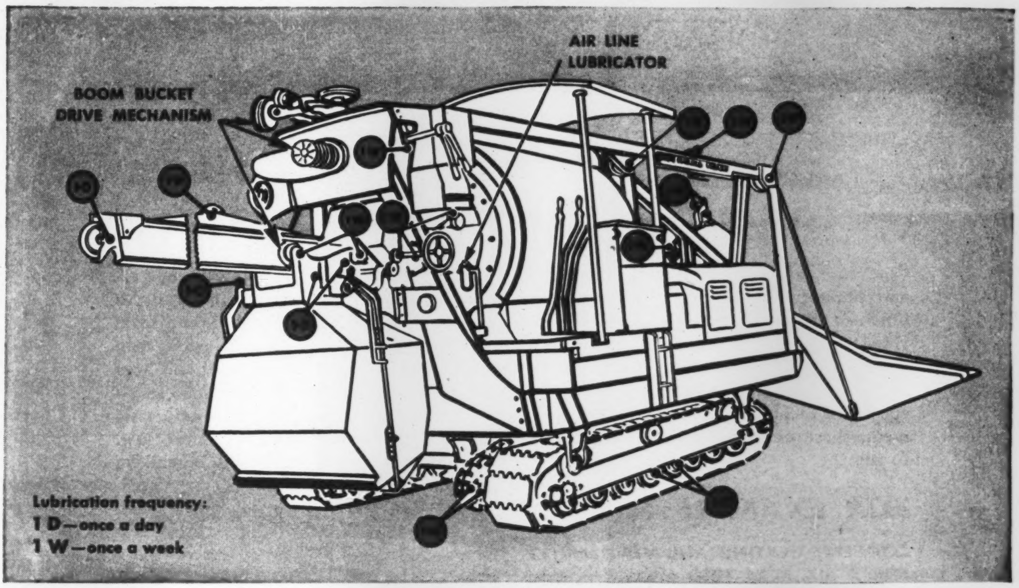
(1) Grinnell Co. v Voorhees, 1 F. (2d) 693.

Written orders for extras

A contract to remodel a store contained the following provision: "No work shall be considered an extra unless a written order has been obtained for same from the 'company' and an express agreement in writing made as to the cost."

During the course of the work the contractor was given oral orders to make certain changes in the work, all to the knowledge of the owner. The contractor was refused payment for the increased cost of the work for these changes because he had not obtained a written order for such extra work as called for by the contract, and then brought an action to recover the same and was allowed a recovery on the ground that the parties by their action had waived the contract requirement of a written order for extra work.[1]

The court in its opinion stated: "It is admitted that plaintiff never received any written orders from defendant for such work. However, the trial justice held that the parties had a right to waive the above provision of the contract requiring written authority to entitle plaintiff to charge for extras, and he also held that the evidence showed that the parties had waived such provision. There is ample authority to support the holding


AIR LINE LUBRICATOR
BOOM BUCKET DRIVE MECHANISM
Lubrication frequency:
1 D—once a day
1 W—once a week

WHERE AND WHEN TO LUBRICATE. Shown above is just one of hundreds of drawings and photos in Cities Service's new EARTH MOVING AND CONSTRUCTION MACHINERY LUBRICATION BOOK. Individual elements of the machine are shown in detail in book.

THERE ARE OVER 20 WEEKLY OR DAILY LUBRICATING POINTS ON CONCRETE MIXER-PAVER

Whether you're the head of a construction outfit, or the operator of a single piece of equipment . . . knowing when, where and with what to lubricate is unquestionably one of your most important functions.

This information, complete with drawings, photos and lubrication charts, is all contained in Cities Service's EARTH MOVING AND CONSTRUCTION MACHINERY LUBRICATION BOOK.

This 56 page book outlines the safest, most complete lubrication maintenance procedures for just about every piece of machinery you might use. It was produced *for you,* as a service *to you* by the Cities Service Company . . . producers, refiners and marketers of the most complete line of the finest petroleum products. For your copy, write: Cities Service Oil Company, Dept. I-14, Sixty Wall Tower, New York City 5.

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Earth Moving and Construction Machinery
LUBRICATION

FREE: Write Cities Service today for the new EARTH MOVING AND CONSTRUCTION MACHINERY LUBRICATION BOOK.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

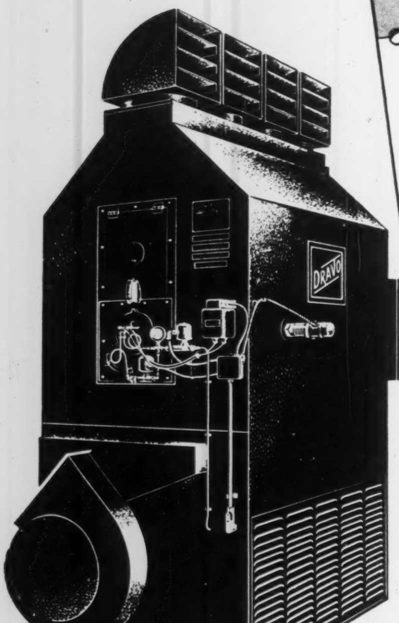
Facts AVAILABLE TO YOU ABOUT..

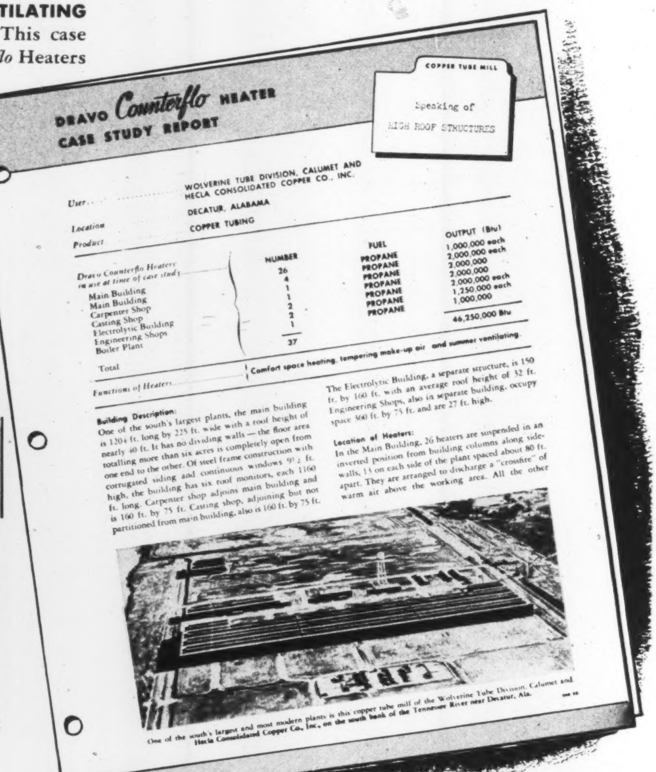
IN THESE *FREE* CASE STUDIES OF ACTUAL INSTALLATIONS...

Complete information—names, diagrams and photographs, along with the results obtained by using Dravo Heaters—is provided in detailed case studies, covering a wide variety of heating problems in many types of industrial buildings. If you buy, specify or recommend space heating equipment, these case studies will be of value to you.

FOR EXAMPLE...

COMPLETE HEATING AND VENTILATING FOR A SIX-ACRE TUBE MILL: This case study tells how 37 Dravo *Counterflo* Heaters provide comfort heat in winter, summertime ventilation and fresh, outside air to replace foul air exhausted by ventilators over furnaces. At this modern plant, heat is delivered at the working level and kept there; the Dravo recirculation system keeps roof heat losses low. Heaters are automatic in operation; maintenance costs are low. Get this case study . . . and others on different problems . . . FREE!





DRAVO *Counterflo* HEATER
CASE STUDY REPORT

COPPER TUBE MILL
Speaking of
HIGH ROOF STRUCTURES

User: WOLVERINE TUBE DIVISION, CALUMET AND HECLA CONSOLIDATED COPPER CO., INC.
Location: DECATUR, ALABAMA
Product: COPPER TUBING

Dravo Counterflo Heaters in use at time of case study

	NUMBER	FUEL	OUTPUT (Btu)
Main Building	26	PROPANE	1,000,000 each
Main Building	4	PROPANE	2,000,000 each
Carpenter Shop	1	PROPANE	2,000,000
Casting Shop	1	PROPANE	2,000,000
Electrolytic Building	2	PROPANE	2,000,000 each
Engineering Shops	2	PROPANE	1,250,000 each
Boiler Plant	1	PROPANE	1,000,000
Total	37		46,250,000 Btu

Functions of Heaters: Comfort space heating, tempering make-up air and summer ventilating.

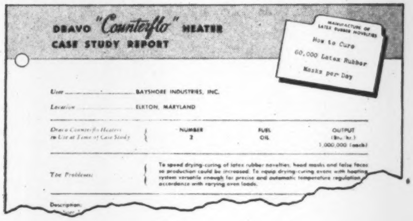
Building Description:
One of the south's largest plants, the main building is 1204 ft. long by 225 ft. wide with a roof height of nearly 40 ft. It has no dividing walls — the floor area totalling more than six acres is completely open from one end to the other. Of steel frame construction with corrugated siding and continuous windows 9½ ft. high, the building has six roof monitors, each 1160 ft. long. Carpenter shop adjoins main building and is 160 ft. by 75 ft. Casting shop, adjoining but not partitioned from main building, also is 160 ft. by 75 ft. The Electrolytic Building, a separate structure, is 150 ft. by 160 ft. with an average roof height of 32 ft. Engineering Shops, also in separate building, occupy space 360 ft. by 75 ft. and are 27 ft. high.

Location of Heaters:
In the Main Building, 26 heaters are suspended in an inverted position from building columns along sidewalls, 13 on each side of the plant spaced about 80 ft. apart. They are arranged to discharge a "crossfire" of warm air above the working area. All the other

One of the south's largest and most modern plants is this copper tube mill of the Wolverine Tube Division, Calumet and Hecla Consolidated Copper Co., Inc., on the south bank of the Tennessee River near Decatur, Ala.

Case studies are 2 to 4 pages long, standard 8½" x 11" size for easy filing, and punched for 3-ring binder.

. VERSATILE DRAVO *Counterflo* HEATERS



MANUFACTURE OF LATEX RUBBER NOVELTIES

DRAVO *"Counterflo"* HEATER
CASE STUDY REPORT

How to Cure 60,000 Latex Rubber Masks per Day

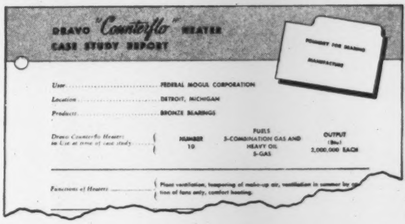
User .... BAYSHORE INDUSTRIES, INC.
Location .... ELKTON, MARYLAND

Dravo Counterflo Heaters in Use at Time of Case Study	NUMBER	FUEL	OUTPUT (Btu/hr.)
	2	OIL	1,000,000 (each)

The Problem: To speed drying-curing of latex rubber novelties, head masks and false faces so production could be increased. To equip drying-curing ovens with heating system versatile enough for precise and automatic temperature regulation accordance with varying oven loads.

Description:

PROCESS DRYING AND HEAT CURING: In industrial production of products such as plastics, wood, rubber, paper, fibers, and ceramics, Dravo Heaters have often increased production due to faster, more efficient drying and curing.



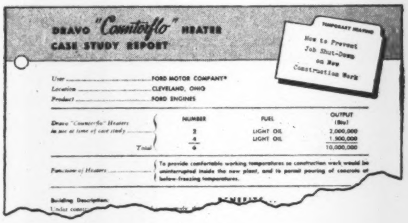
DRAVO *"Counterflo"* HEATER
CASE STUDY REPORT

User .... FEDERAL MOGUL CORPORATION
Location .... DETROIT, MICHIGAN
Products .... BRONZE BEARINGS

Dravo Counterflo Heaters in Use at time of case study	NUMBER	FUELS	OUTPUT (Btu)
	10	5-COMBINATION GAS AND HEAVY OIL 5-GAS	2,000,000 EACH

Functions of Heaters .... Plant ventilation, tempering of make-up air, ventilation in summer by op tion of fans only, comfort heating.

TEMPERING OF MAKE-UP AIR: Where the necessary removal of noxious fumes or harmful dusts from the air makes comfort heating for workers difficult, Dravo Heaters warm replacement air and keep temperatures constant.



TEMPORARY HEATING

DRAVO *"Counterflo"* HEATER
CASE STUDY REPORT

How to Prevent Job Shut-Down on New Construction Work

User .... FORD MOTOR COMPANY*
Location .... CLEVELAND, OHIO
Product .... FORD ENGINES

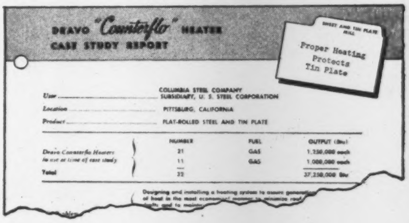
Dravo "Counterflo" Heaters in use at time of case study	NUMBER	FUEL	OUTPUT (Btu)
	2	LIGHT OIL	2,000,000
	4	LIGHT OIL	1,500,000
Total	6		10,000,000

Functions of Heaters .... To provide comfortable working temperatures so construction work would be uninterrupted inside the new plant, and to permit pouring of concrete at below-freezing temperatures.

Building Description:
Under constr

BENEFITS . . .

TEMPORARY HEATING: Dravo Heaters provide comfort heating and increase worker-efficiency during building construction and can keep ground temperature above freezing for pouring and setting concrete floors during cold weather.



SHEET AND TIN PLATE MILL

DRAVO *"Counterflo"* HEATER
CASE STUDY REPORT

Proper Heating Protects Tin Plate

User .... COLUMBIA STEEL COMPANY SUBSIDIARY, U. S. STEEL CORPORATION
Location .... PITTSBURG, CALIFORNIA
Product .... FLAT-ROLLED STEEL AND TIN PLATE

Dravo Counterflo Heaters in use at time of case study	NUMBER	FUEL	OUTPUT (Btu)
	21	GAS	1,250,000 each
	11	GAS	1,000,000 each
Total	32		37,250,000 Btu

Designing and installing a heating system to assure generation of heat in the most economical manner to minimize roof drafts and to mainta

COMFORT HEATING LARGE BUILDING AREAS: Garages, diesel repair shops, auditoriums, etc. with large open spaces are heated comfortably and easily . . . Dravo Heaters provide quick, automatically controlled, low-cost heat.

DRAVO HEATERS OFFER YOU:

- **LOW INITIAL COST**—Users report 30% to 60% savings over "wet-type" systems.
- **EASY INSTALLATION**—Need only fuel, exhaust and electrical connections . . . no ductwork.
- **LOW OPERATING COST**—Direct-fired . . . burn gas or oil . . . readily converted . . . minimum efficiency 80%.
- **AUTOMATIC OPERATION**—on-off or modulating controls . . . no constant attention required.
- **LONG SERVICE LIFE, LOW MAINTENANCE**—Stainless steel combustion chamber eliminates refractory lining.
- **SAFETY**—Approved by American Gas Association, listed by Underwriters' Laboratories, Inc.; Dravo standardized safety control circuit accepted by Factory Mutual Engineering Division.
- **MOBILITY**—Can be moved to any location.
- **FLEXIBILITY**—When floor space is limited, can be wall-hung or suspended from trusses in any position.

"CASE STUDIES INVALUABLE," writes a Heating Engineer. "They are informative and highly useful to me."

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of the trial justice that the parties may waive their rights in such circumstances. 12 Am. Jur. Contracts, section 428, pp. 1007, 1008."

Sufficiency of work

A contractor will not be held liable for the insufficiency of the work where the owner undertakes to direct and does direct the builder how the work is to be done and the builder is forced to do the work in a manner contrary to the way he wanted to do it and in spite of his admonition that the work as being done was inadequate.[1]

The court in its opinion stated: "The defendant Wiesner relies on the doctrine of implied warranty and cites statements of law from various cases. He leans heavily on a statement contained in City of McPherson v. Stucker, 122 Kan. 595, 256 P. 963, which reads: 'When the principal object of a contract is to obtain a result, there has been no compliance with the contract until the result has been obtained.

" 'Where the contract contains a guaranty or warranty, express or implied, that the builder's work will be sufficient for a particular purpose, or to accomplish a certain result, unless waived by the owner, the risk of accomplishing such purpose or result is upon the builder, and there is no substantial performance until the work is sufficient for such purpose or accomplishes such result. 9 C.J. 745.' 122 Kan. at page 600, 256 P. at page 966."

The court found as a fact that the agreement did not contain any express warranty as to the sufficiency of the work.

(1) Glass v Wiesner, 238 P. 2d 712, Supreme Court of Kansas, Dec. 8, 1951.

Estimate does not control

A construction contract provided that the work was to be done within the estimated cost of $13,100, and also provided that said estimated cost was only an estimate by the contractor who in no way shall be responsible for fluctuation of prices of labor and materials. The court held that the presence of the restrictive and qualifying word "estimated" would make it unreasonable to construe the contract as fixing a ceiling price of $13,100 as the cost of the work.[1]

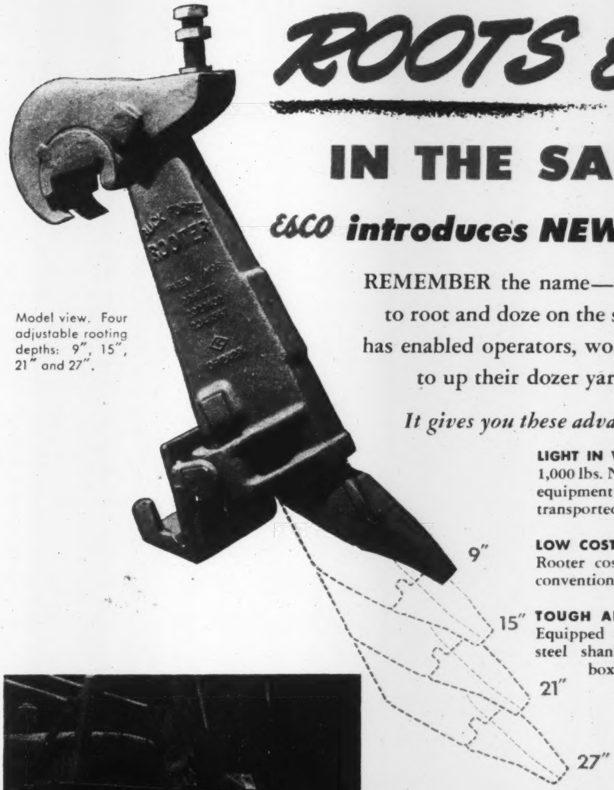
(1) Jones v. Pollock, 215 P. 2d 733, Supreme Court of California, March 14, 1950.)

(These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.)

ROOTS & DOZES

IN THE SAME PASS...

ESCO introduces NEW BUCK FORTE ROOTER



Model view. Four adjustable rooting depths: 9", 15", 21" and 27".

REMEMBER the name—Buck Forte Rooter—especially designed to root and doze on the same pass. This dual feature of operation has enabled operators, working with a pair of Buck Forte Rooters, to up their dozer yardage over 50%. *That's a job-proven fact.*

It gives you these advantages:

LIGHT IN WEIGHT. Less than 1,000 lbs. No special handling equipment required. Can be transported on the tractor.

LOW COST. The Buck Forte Rooter costs 75% less than conventional rooters.

TOUGH AND DEPENDABLE. Equipped with *ESCO* alloy steel shank and renewable box type points, it has proved itself in concrete, rock and hardpan.

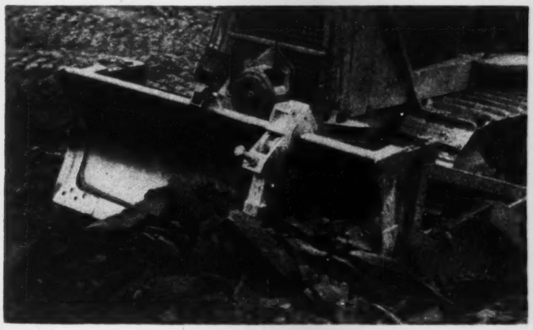
EASILY INSTALLED. One man can install or remove the rooter in minutes with no cutting or welding on dozer.

ADJUSTABLE. Four adjustable rooting depths—9", 15", 21" and 27".

FITS ALL LARGE, STRAIGHT DOZERS. Can be used in pairs or singly.

Get more information on the new Buck Forte Rooter—Just see your ESCO dealer or fill in and mail the coupon.

Rooter mounted on dozer blade. Second rooter is usually installed to double effectiveness.



Buck Forte Rooter on a straight dozer rooting unshot sedimentary ocean rock for aggregate plant.

ESCO DRAGLINE BUCKETS, DIPPERS AND HOE DIPPERS

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58-FOOT REACH

. . . driving Monotube piles!

National
ENGINEERING AND CONTRACTING COMPANY CLEVELAND, OHIO
Standard Crane

Inset shows long, extended pile being welded.
Project: Cleveland Memorial Shoreway
Engineers: Ohio State Highway Department
General Contractor: National Engineering and Contracting Company, Cleveland, Ohio

Standard Crane Reaches 58′ from Lake Erie Shore to drive 150′ Monotubes!

LIGHT weight and on-the-job extendibility—twin features of Monotube tapered piles—saved the expense of special rigs or heavy driving equipment on this project.

These *cold-rolled,* fluted steel Monotubes (standard 12″ butt diameter) were put down in sections, extensions welded on the spot, and—when completed to an average length of 150′—readily inspected from top to bottom before concreting.

Monotube piles are affording important savings on all types of jobs. Our engineers will be glad to consult with you. For complete information write The Union Metal Manufacturing Co., Canton 5, Ohio.

UNION METAL

Monotube Foundation Piles

BOOK REVIEW

Hoover looks back

THE MEMOIRS OF HERBERT HOOVER—Volume 1, Years of Adventure (1874-1920); Volume II, The Cabinet and the Presidency (1920-1933). The Macmillan Company, 60 Fifth Ave., New York 11. Vol. 1, $4.00; Vol II, $5.00.

Herbert Hoover's career as an engineer covers but a small part of the 60 years spanned in these two 400-page volumes, yet it is a record so full of interest and of evidence of the driving force of that young engineer as to make me wish that it could be separately printed so that it could be put into the hands of our young engineering graduates.

This is not to say that the other parts of the books are without interest, for they are full of it and make absorbing reading. But they tell of the activities of a man in such exeeptional positions or in such high positions as to lack the personal appeal to young men that is found in the first part of this autobiography.

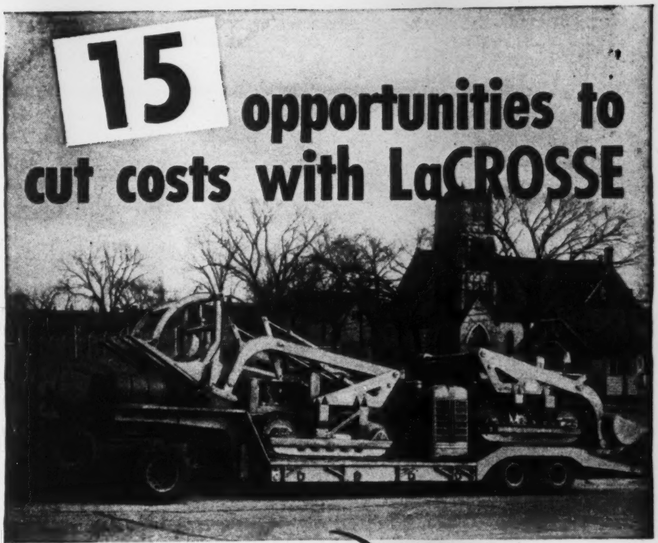
Hoover's account of his work as head of the Belgian Relief and later as head of all the relief work in Europe following the armistice of World War I is a deeply moving record of a long struggle against unbelievable obstacles in which the human elements were much more difficult to surmount and more exasperating than the physical ones.

Hoover is bluntly frank in his observations about the people who impeded his work to serve selfish personal or national aims, and with good reason, judging by the record. He is equally free with commendation for the many who worked with him and for those who helped him overcome the opposition of people high in military or OT in government service in Europe.

Quite a different type of record is found in the second volume, which contains accounts of his life in the cabinets of Presidents Harding and Coolidge, his observations as to his own election to the Presidency and as President. All, however, are equally fascinating reading.

Considerable space in the second volume is given over to discussions of broad national and international issues.

They serve to reveal how much Hoover did while Secretary of Commerce and later as President to inaugurate and advance government reforms which are not generally associated with his name.



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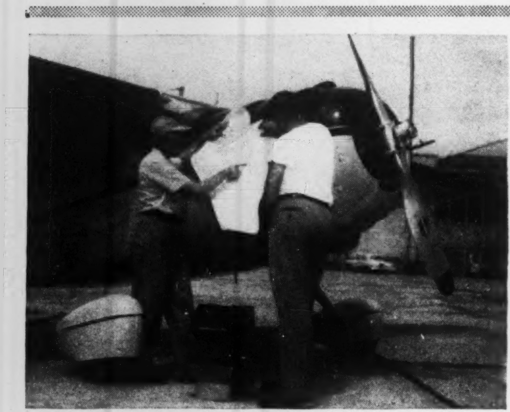
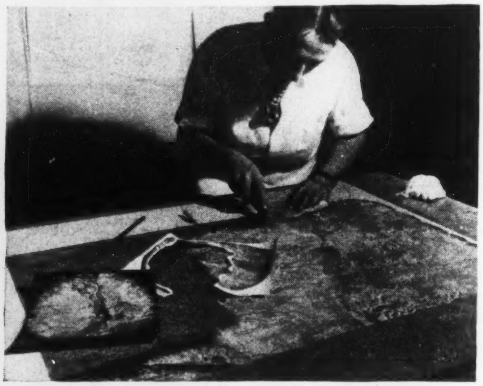


PILOT STOLL AND PHOTOGRAPHER SLACK, of Aero Service, check progress before the day's aerial survey work begins.



PUTTING THE MAP TOGETHER requires skill, patience and experience. Only a small part of each photo can be used.

Photogrammetry saves cities time and money

In these days of short-handed engineering staffs an aerial mapping program has been a source of relief to many municipalities.

Here are the stories of two cities and how and why they used an aerial mapping program:

Let's take Raleigh, N. C., first; it is typical of the small city and its requirements.

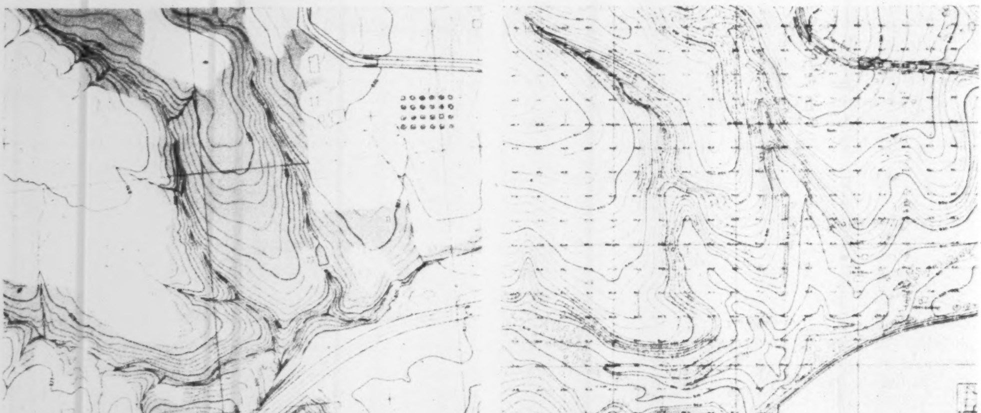
Raleigh needed a new map and its city officials realized a saving of over 50% by turning to an aerial survey.

Inquiries were sent to several engineering companies requesting cost information on regular topo surveys. The lowest estimate was $75,000 and some of the engineers were reluctant to name any price.

Raleigh's engineering department was too understaffed to tackle the job so the possibility of an aerial survey was investigated. Aero Service Corp. of Phipadelphia was awarded the contract for a bid price of $33,687.

Aero Service's contract included all the horizontal and vertical control work on the ground as well as the photos, in addition to the finished maps. The photos were taken in March, and the ground party completed the control work early in June.

The contract required Aero Service to photograph 60 sq mi for a topo map of 40 sq mi. Raleigh will receive two mosaics (1 in. equals 600 ft scale), three sets of contact prints, three sets of maps (1 in. equals 200 ft) with 5 ft contours and all build-



SAME AREA; DIFFERENT METHODS. The map on the left was made by photogrammetry. The map on the right was made by the more usual field survey methods. The amount of detail is controlled by the amount of money available.

Manufacturers of Toncan Iron Drainage Products

BEALL PIPE & TANK CORPORATION
PORTLAND, ORE.
BOISE, IDAHO

BERGER METAL CULVERT CO., INC.
WESTMINSTER STATION, VERMONT

THE BOARDMAN COMPANY
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BLUEGRASS PIPE & CULVERT CO.
LOUISVILLE, KY.

CENTRAL CULVERT CORPORATION
ALEXANDRIA, LA.

CHOCTAW, INC.
MEMPHIS, TENN.

DOMINION METAL & CULVERT CORP.
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EATON METAL PRODUCTS CORP.
OMAHA, NEB.
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EATON METAL PROD. CO. of MONTANA
BILLINGS, MONT.

EMPIRE STATE CULVERT CORP.
GROTON, N. Y.

ILLINOIS CULVERT & TANK CORP.
PEORIA, ILL.

JENSEN BRIDGE & SUPPLY COMPANY
SANDUSKY, MICH.

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M & M HIWAY MATERIALS CO.
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REPUBLIC STEEL CORPORATION
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THOMPSON PIPE & STEEL COMPANY
DENVER, COLO.

TRI-STATE CULVERT & MFG. CO.
TAMPA, FLA.
DECATUR, GA.

UTAH PIPE & STEEL COMPANY
OGDEN, UTAH

WISCONSIN CULVERT COMPANY
MADISON, WIS.

WYATT METAL & BOILER WORKS
DALLAS, TEX.
HOUSTON, TEX.

VIBRATION inside and out—but TONCAN IRON® SECTIONAL PLATE PIPE cannot crack!

Sometimes Toncan Iron Sectional Plate Pipe is used for purposes other than carrying water. This 12-foot diameter, 80-foot long pipe is a good example—both of unusual application and the ability of Corrugated Metal Structures to stand up under severe vibration and shock from traffic above and within. *Flexible pipe* like this lasts indefinitely . . . cannot crack or crumble. Exclusive two-inch-deep corrugations provide highest possible strength.

Another reason for the long life of Toncan Iron is its resistance to rust . . . the highest of any ferrous metal in its price class. It's an *ALLOYED IRON* . . . contains twice the copper ordinarily used in copper-bearing steels and irons—*plus* the proper amount of molybdenum to make the copper most effective.

Ask your Toncan Iron Manufacturer to tell you about the ease of handling, hauling and installing Toncan Iron Drainage Structures—or write us.

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TONCAN IRON

Toncan Copper Molybdenum Iron Drainage Products include:
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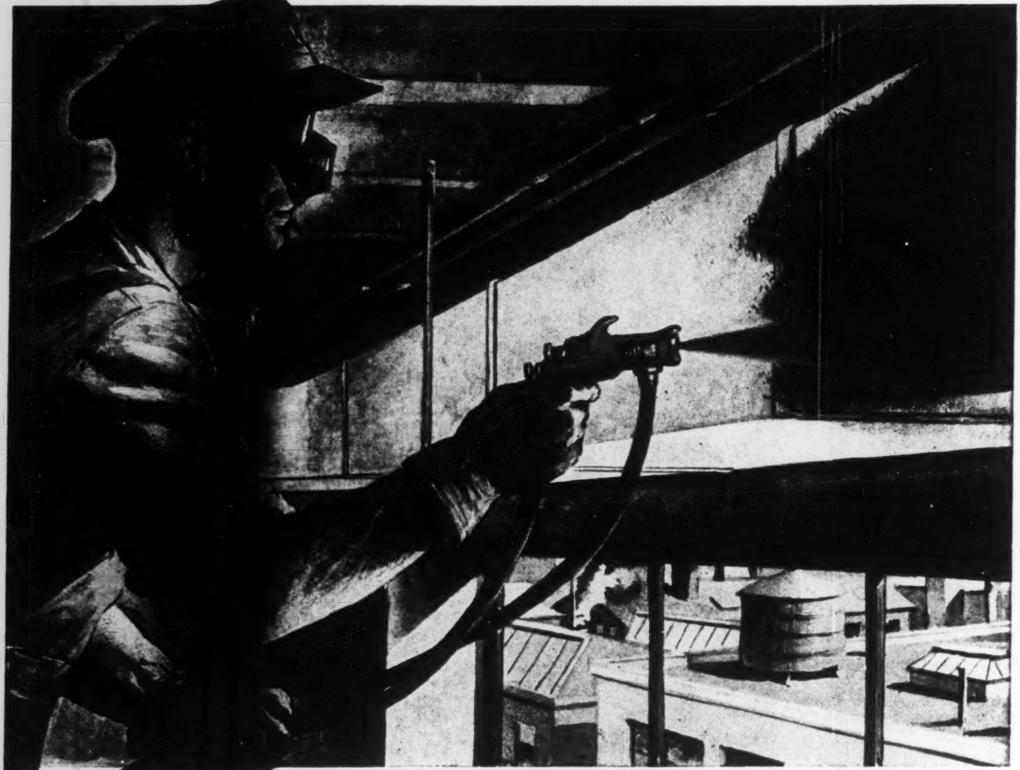

Deadener Does Double Duty!

. . . Flintkote sound deadener coatings also give moisture protection

When light metal objects set up howls or humming noises, it's time to go gunning for vibration.

Load up your spray gun with Flintkote Sound Deadener and you'll smother noises *pronto*...all along the line.

In addition, you'll shut out moisture...and so kill two birds with one shot.

Use spray- or trowel-applied Flintkote Sound Deadeners on noisy ventilation ducts, blowers, steel partitions, flues and other light sheet metal.

Choose a high tenacity, quick drying solvent type or a non-inflammable emulsion type sound deadener. Flintkote offers you both.

Get complete information on this two-way Flintkote sound and moisture protection. Increase personnel efficiency...save nerves, and money.

And for a quick, "meaty" description of other Flintkote materials that may be able to serve you better, write for your copy of the new "Flintkote Industrial Products Digest."

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FLINTKOTE INDUSTRIAL PRODUCTS

FLINTKOTE
Products for Industry

RESULTS OF THE RALEIGH SURVEY are examined by Mayor James E. Briggs (left) and City Manager William Carper (right). Map is a mosaic. (Photo by Burnie Batchelor)

ings shown, and one composite print (1 in. equals 1,000 ft).

• **Payment**—Paying the contract price offered a problem to Raleigh; so it was agreed to spread the payments over three years and take the money out of the city's general fund. Aero Service will receive $5,000 this year on delivery of the mosaics. One-half of the remainder is scheduled for payment during the 1952-53 fiscal year upon completion of all ground work. And the final payment in 1953 will be made after completion of all maps.

• **Why**—Raleigh's last map was made in 1938 and a topo map never has been made.

Several reasons prompted Raleigh officials to start the program.

It was becoming increasingly difficult to keep the 1938 map up to date. Much of the city's growth has been taking place outside of the corporate limits. A large program of sewer and street construction is under way and construction of a sewage treatment plant is scheduled to be completed by 1955. It is still in the planning stage and the contour map of outlying areas will be essential.

The map, which will show all buildings, will be of great value to Raleigh in its tax revaluation program in conjunction with Wake County.

Raleigh's population has increased from 47,000 in 1940 to 65,000 in 1950. The city limits were extended by 3.48 sq mi in 1942 to the present area of 11.0 sq mi.

No special work was included in the contract with Aero Service; however, city officials originally planned to request that all sewer manholes be shown on the map. The plan was dropped before the mapping was begun.

In charge of the program for Raleigh are J. B. Lambeth, Director of Public Works, and H. W. Stevens, Director of Planning.

Now let's turn to a larger city—Cincinnati, Ohio—and find its reasons for an aerial survey. Cincinnati engaged Fairchild Aerial Surveys, Inc., of Los Angeles, Cal., for the work.

Cincinnati's new topographic survey not only resulted in a better study of land uses, but also saved money and time.

The city, in conjunction with Hamilton County, embarked upon a comprehensive program designed to map the entire city-county area of 414 sq mi on 610 map sheets in April, 1948, and expects to complete the program in 1954.

Several factors were involved in the city's decision to use an aerial mapping system over the conventional way.

Cost and speed were the main factors. Once aerial photos of a designated sector are taken and ground controls have been set, the weather no longer proves to be a factor. Cin-

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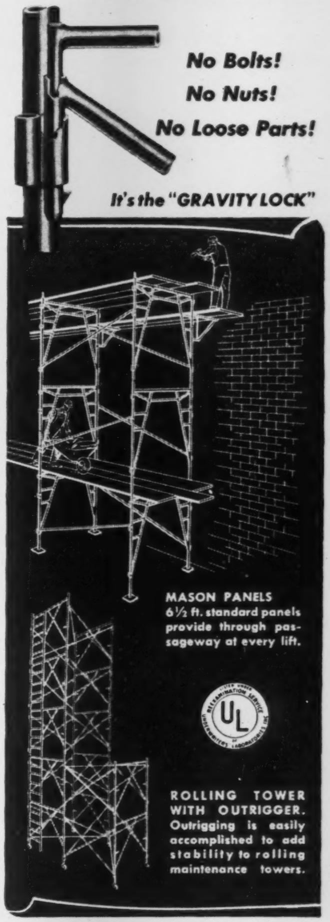

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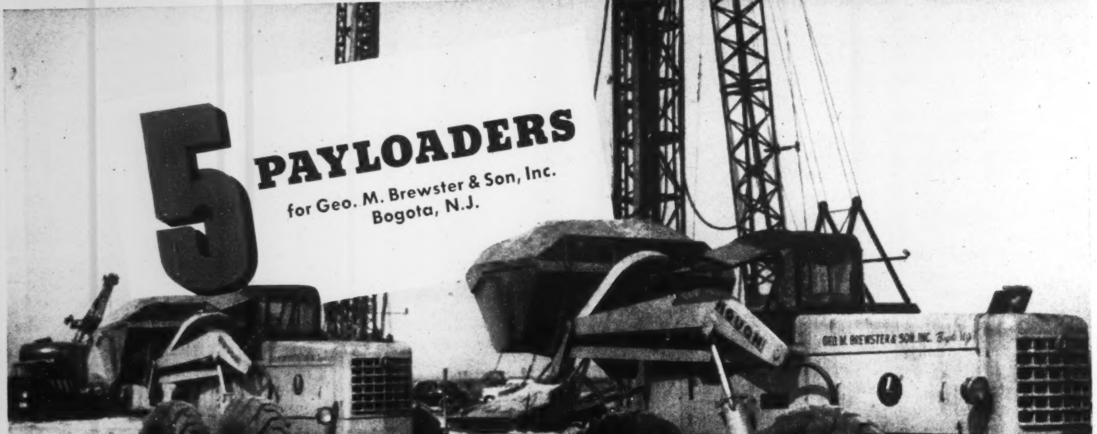
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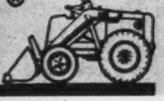

The Surveyor's Notebook

Reporting on Unusual Surveying Problems and Their Solutions

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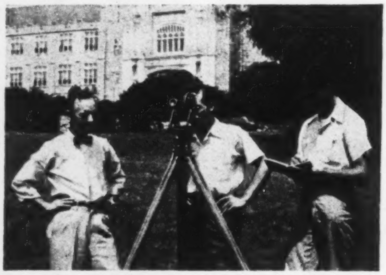


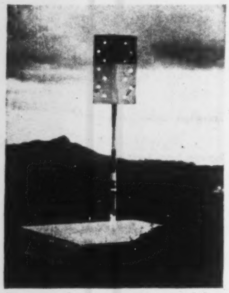
Prof. Russell Brinker (left) instructs students at VPI in the use of the transit. The instrument is one of 25 Gurley transits and levels owned by VPI.

"Surveys in Hawaii introduce many new features to a surveyor trained on the mainland," says Russell Brinker, Head of the Department of Civil Engineering at Virginia Polytechnic Institute.

"The ancient land system divided an island roughly into several *mokus* (districts). Each *moku* was split into *ahupua'as,* pie-shaped pieces extending from ocean to mountain top and varying considerably in area.

"Theoretically, each *ahupua'a* contained a *kai* (sea fishery), a stretch of *kula* (upland) and some *kuahiwi* (forest and mountain land). Thus, the ruling chief and his people could get fish, taro and wood from their own land holdings in the Islands.

"To trace old deeds, today's surveyor must be able to read descriptions in a 12-letter Hawaiian alphabet. Simple terms like North and South are frequently discarded in favor of visual directions. What, then, could be easier than to send a rodman a bit more *mauka* (mountainward) or a few feet *makai* (oceanward)? Or to tell the chainman to move Diamond Head-way or Punchbowl-way?



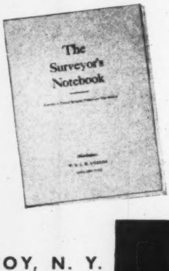
Triangulation stations like this are common in Hawaii.

"In the mid-'30's, I surveyed small parcels in the Islands for the Government, so that portions could be taken out of rice production. Standard practice was followed the first half day by measuring angles at corners, and lengths along dike sides of the flooded rice paddies. Since ties between adjacent ownerships and exact areas were not needed, a faster, less accurate method seemed necessary.

"So we set up near the estimated center of an individual farm on a paddy bank. Two rodmen started at diagonally-opposite corners and moved clockwise around the field. Stadia distances and azimuths from an arbitrary reference line were read on the two rods in alternate order and recorded.

"As soon as all corners had been sighted, we set up in the next field and repeated the process. Readings were plotted later and areas obtained by planimeter."

Have you received your copy of the collected stories from "The Surveyor's Notebook"? The book contains all articles and field tips from the first year's series. Thousands of surveyors are finding that it is very helpful in their work.



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What's your story? We would like to feature it in a future page in this series. Drop us a line, outlining your idea. We'll contact you later for full details.

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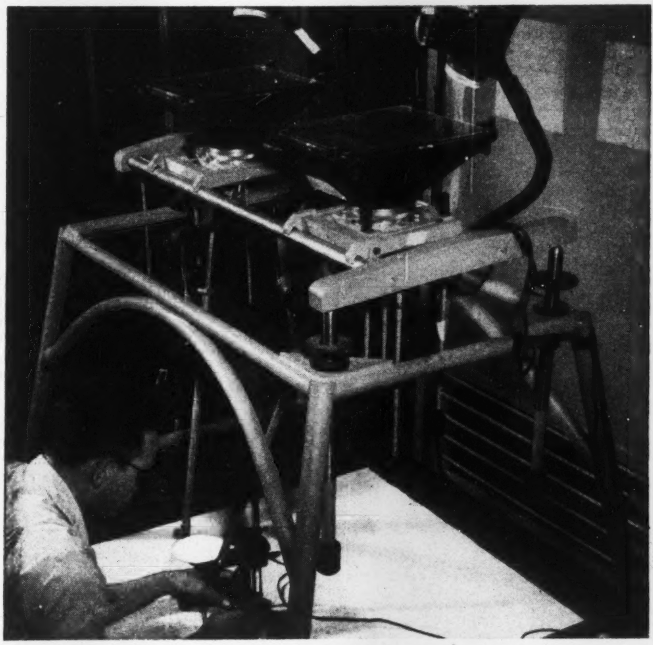


MAKING A TOPOGRAPHIC MAP from aerial photos using a stereoptical projector and special glasses. Several types of projectors are in use.

cinnati's weather allows only nine months in the field, and then only 80% of this period is working time.

As to the actual savings, it is estimated that the city's cost was about one-half of the cost of a field mapping system. And, city engineers add, personnel are hard to get for this type of work.

The contract with Fairchild is renewed annually. The current cost of living is the basis for a new contract.

• Cost—The over-all cost of the program will amount to about $1.1 million. Supervision of all operations and contracts and the establishment of the secondary and photo control network are the responsibility of the City Engineering Division.

The first order horizontal and vertical control points, constituting the basic net to which all mapping control is integrated, were established by the U. S. Coast and Geodetic Survey in 1947, with the co-operation of the city. Early in 1948, some consideration was given to the use of the plane table to obtain the topography. However, after a review of comparative costs, this method was rejected in favor of the economy and speed of the photogrammetric process. It also avoided unduly expanding the city engineering staff.

The technical methods and coordination were worked out between the city and the consultant, Fairchild. The city handled all negotiations.

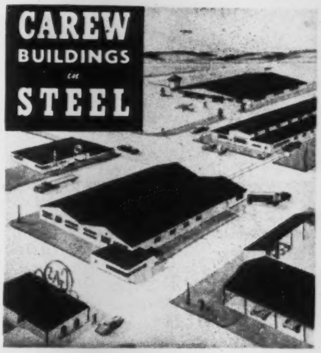
Following completion of the primary net by the USC&GS, the work started.

The entire county was photographed twice, once with a camera suitable for the construction of the precision contour map, from an elevation of 6,250 ft above the ground. The second was done with a special camera of very long focal length (24-in.) and was flown from a height of 25,000 ft.

• Maps—The city decided that maps of the county at a scale of 1 in. to 200 ft, with 5 ft contours, made up in quadrangle sheets of 4,000 ft north and south by 5,500 ft east and west, and a set of photomaps at exactly the same scale, divided into identical sheets, would best serve the community needs.

With these maps it is possible to study every acre of the county in complete detail by placing the topographic map and the photomap side by side.

The compilation of the maps involved the establishment of a network



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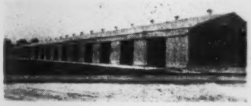

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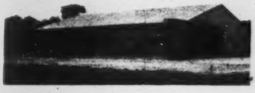

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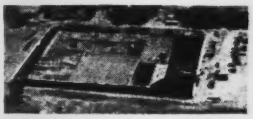

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of control points by ground-survey methods. During the first months, a coordinator was supplied who worked with the survey parties and selected in the field the so-called "picture points" or photo-control points, such as the intersection of crosswalks or weed patches which were recognizable on the ground and visible on the photographic prints as sharply defined points. These points are then coordinated to the map network by city crews and their computed positions were forwarded to Fairchild.

• **Using the maps**–The topographic maps have their uses daily. They are used in the design of the drainage systems of the city and county, and in addition, they are constantly referred to for grade and alignment determination of proposed streets and for the estimation of excavation quantities and costs.

Utility distribution can be planned and future needs seen graphically. The ratio of developed to vacant land can be counted on the photomap.

Nearly every imaginable kind of problem can be planned on the photomap and engineered on the contour map. Each and every house and tree and acre of land in the city is revealed in detail.

Aero Service Inc. analyzes map costs

Most city engineers or city managers want to know how much will an air survey cost us, and how soon can we get delivery?

Several factors enter into the cost: First of all the weather record for the area is studied. Days when the survey crew is grounded because of poor weather cost money, almost as much as the days when they fly.

The special geographic characteristics or industrial characteristics of the city would be considered. A Pittsburgh, which has days of industrial smog, would be more expensive to map than a community without this problem.

In general 5-10% of the cost of a city mapping job goes into flying. Field work takes 25-40% of the total. This percentage depends on how much control already exists.

For example, Cleveland has a large amount of monumented control, so that costs there, for field work, would be in the neighborhood of 10%. Other cities have limited control, and it may be necessary to tie into basic monuments at some distance from the city. Or, the city may have control whose accuracy is doubtful, and similarly, other tie-ins must be made.

Finally, the mapping program may call for us to monument for the city's use, which increases costs considerably.

Field editing–the adding of street names, railroads, and other local names, as well as identifying any structures not readily recognizable on the air photos–is another part of the field work cost.

The rest of the aerial survey costs go into map compilation expenses, for usual administrative cost and for profits.

A topo map, scale 200 ft to the in., with a 5 ft contour interval would cost about $720 to $1,250 per sq mi. Its cost depends on the type of country and how much planimetric detail is required in the finished map. If the area to be mapped is less than 15 sq mi, this figure would probably increase to 10-15%.

Some cities want maps at a scale of 200 ft to the in. with a 2 ft interval. Costs for such maps are about 2½ times the cost cited above.

Some city's requirement or budget calls for only photo mosaic coverage. In general, costs for flying a small city range from $1,600-$2,500 per sq mi. These costs cover the flying and delivery of a set of photos for the entire city. Compilation of these photos into a controlled mosaic, scale 400 ft to the in. would cost approximately $40 per sq mi, in addition to the flying costs.

For the flying of a city at a scale of 1,000 ft to the in., the cost would be $12 per sq mi plus $10 per sq mi for the mosaic.

There are seasons in the mapping business. Aerial photography must be done when the leaves are off the trees –in the early spring before the foliage appears, or in the fall after the leaves have fallen but before the first snowfall.

In general, deliveries on a city photomosaic can be made within 2 to 6 months. For a city of 35,000 to 40,000 population the complete deliveries of topographic maps can be made in one mapping season–roughly one year's time. For larger cities the aerial topographic mapping is no more than a 2 or 3 year program.

Some estimates of a ground program done by a city's own staff reach to 15-20 years' time by way of comparison.

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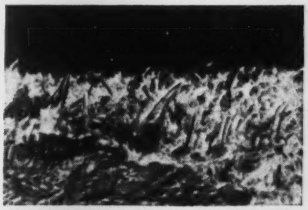
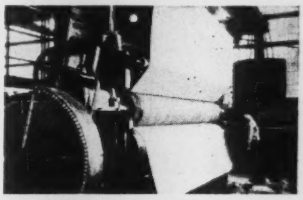
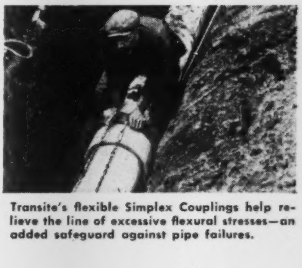


This photomicrograph shows how the tough, strong asbestos fibers are distributed uniformly throughout the structure of the pipe.



On machines like this, the asbestos-cement-silica mixture is "built up" under heavy pressure into a dense, homogeneous pipe structure.



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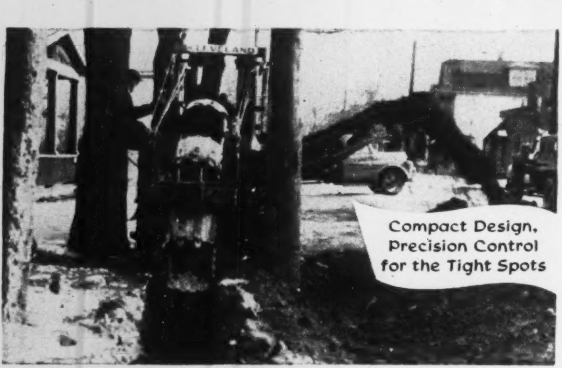
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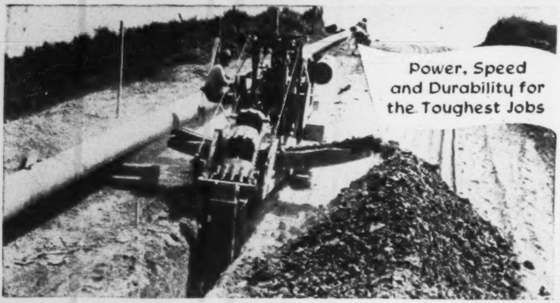
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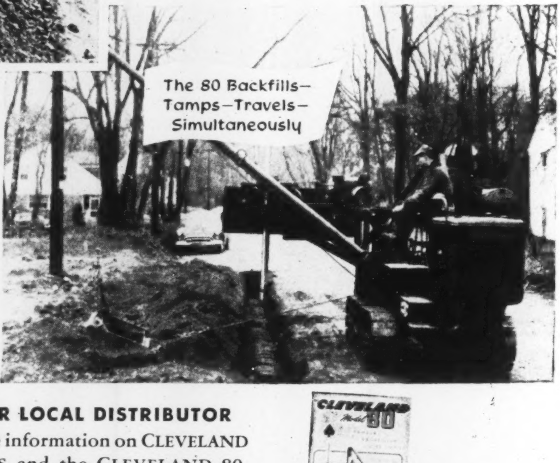
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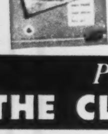
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Builder replaces defective houses

A joint committee of federal, state and local building officials formed by the regional office of the Veterans Administration in San Diego, Calif., announced recently that it has persuaded one contractor to repair 180 storm-damaged homes under the V. A.'s mortgage-loan guaranty program during the past two years.

In addition E. L. Tagwerker, chief of the V. A. Loan Guaranty Division in San Diego, said another contractor has given new houses to three owners whose original homes were cracked and twisted by sinking land. A fourth owner refused to accept the settlement offered. He has filed suit in Superior Court in order to recover from damages sustained.

The restitution program grew out of a total of about 2000 complaints from veterans in the San Diego area that their new homes developed structural deficiencies shortly after they moved in to them. Most of the complaints developed after last winter's heavy rains produced floods and landslides which caused considerable damage to homes located in the Southern California area.

Tagwerker said that the J. W. Anderson Construction Co., has furnished him reports testifying to completion of repairs on a total of 180 homes in six tracts. These homes suffered largely from water damage, Tagwerker said. All were of the concrete-slab type and difficulty was experienced with water seepage between mudsills and slabs.

The repair work consisted largely of applying waterproofing material to concrete and stucco, replastering, redecorating and laying of new asphalt tile or hardwood block flooring on the concrete slab. Water in the homes had acted on the water soluble adhesive used for the tile and block flooring.

In several cases where foundations had parted from concrete slabs the gaps were grouted using the gunnite process.

Tagwerker said the Anderson firm still has several tracts on which it has indicated it will report repair work when completed.

• **New homes**—The Hubner Construction Co., agreed with the joint committee to substitute new homes for four which were damaged in its Redwood Village tract. The homes were built on a deep fill, but the engineering firm which laid out the tract

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under supervision of the San Diego city engineer insisted the fill was properly compacted.

However, portions of the foundations of the four houses sank from 6 in. to 12 in. or more, cracking the concrete slab floor, skewing doors, shearing gas lines and leaving wide gaps in plaster and stucco finishes.

The V. A. Loan Guaranty Division agreed to transfer the V. A. mortgage insurance of the three veterans who accepted the offer from the damaged houses to the new houses. The fourth case where the owner brought suit, still awaits a state court ruling.

Tagwerker said Mobile Homes Corporation of San Diego has agreed to repair homes in two V. A. mortgage insured tracts on which damage has been reported, but no reports have been received on its work as yet. The chief complaints against Mobile Homes' houses was that nails used in the dry wall construction popped out and there was excessive shrinkage in finishing lumber, leaving gaps in mitered joints around doors and windows up to ½ in.

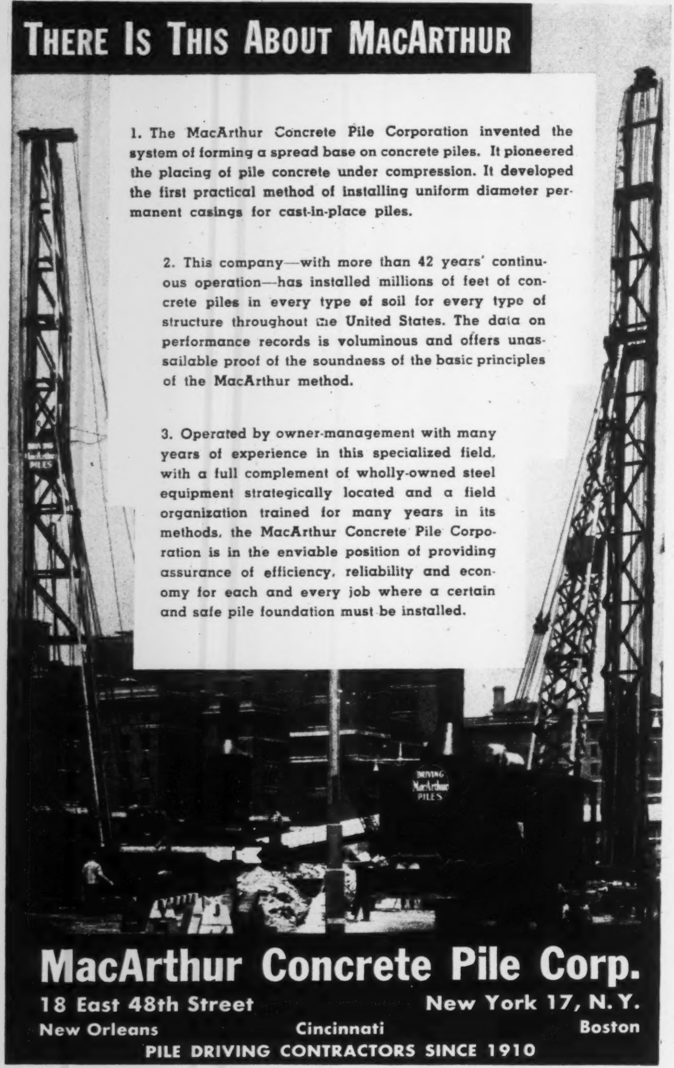
The restitution program began after Tagwerker was instrumental in forming an unofficial committee of representatives of V. A., the California Contractors' Licensing Board and the San Diego Building Contractors Assn., Inc., an organization of contractors and subcontractors engaged primarily in construction of houses. Anderson is not a member of the association, but Mobile Homes is.

• **Claims**—In announcing the repair work program Tagwerker made it clear that both V. A., and the joint committee found that many of the 2000 complaints from veterans were unjustified. In other cases, he said, the committee found that veterans had signed petitions to bolster claims of neighbors, even though they had suffered no deficiencies on their own properties.

All of the homes on which complaints were registered were constructed prior to the time Tagwerker and other new V. A. Loan Guaranty Division officials in San Diego took office a year ago.

They replaced a group of officials which resigned after a joint F. B. I. and V. A. investigation into home loan practices in San Diego brought several arrests, several of which later turned into federal grand jury indictments.

The Teague Committee of the House heard testimony in San Diego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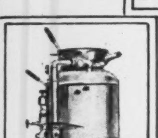
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√ reduced maintenance
√ less cleaning time

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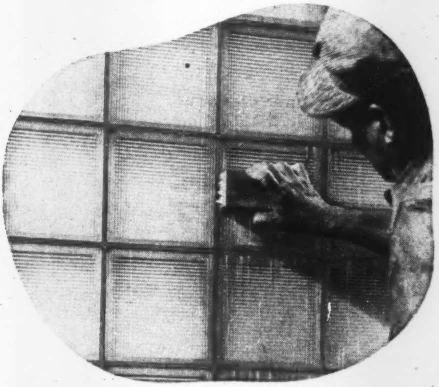

ANSWER . . . PC Functional Glass Blocks not only offer you the utmost in controlled, natural daylight, but they are simple to install and reduce cleaning and maintenance costs substantially. One reason for this is the exclusive "Clean-Easy Face Finsh" on these blocks, explained here.

▸ The "Clean-Easy Face Finish" is a transparent coating applied to the surface of PC Functional Glass Blocks during manufacture. It repels water, prevents splashes of mortar and installation scum from adhering to the glass block panels. Thus, completed panels can be cleaned more quickly and easily. In fact, this finish cuts initial cleaning time in half. This means reduced installation costs.

Moreover, the PC "Clean-Easy Face Finish" results in a crystal-clean block face that is devoid of rough areas or marks in which dust, grease or other dirt particles can accumulate. Occasional rainfall keeps the exterior of the finished glass block panel clean, retaining the original beauty, light-transmitting efficiency, and control of daylighting inherent in the particular PC Functional Glass Block pattern.

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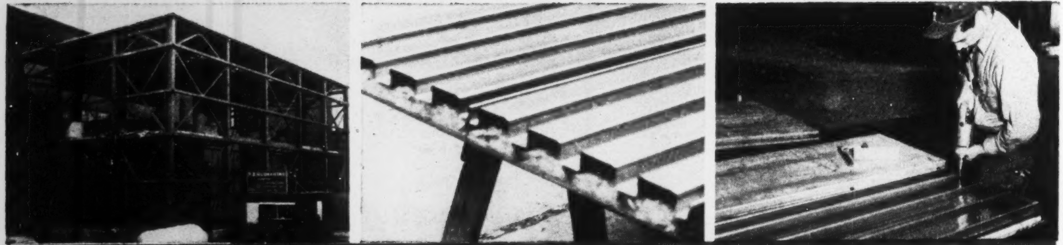
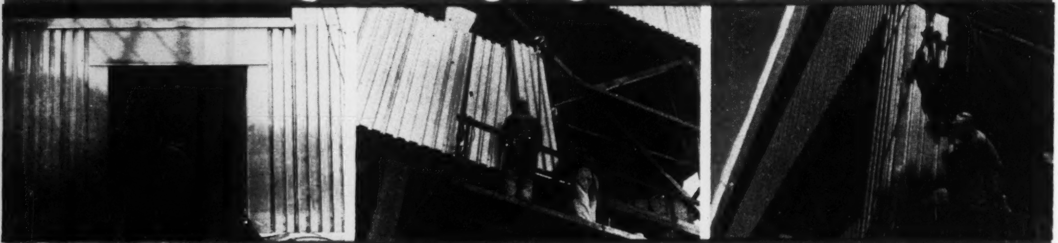
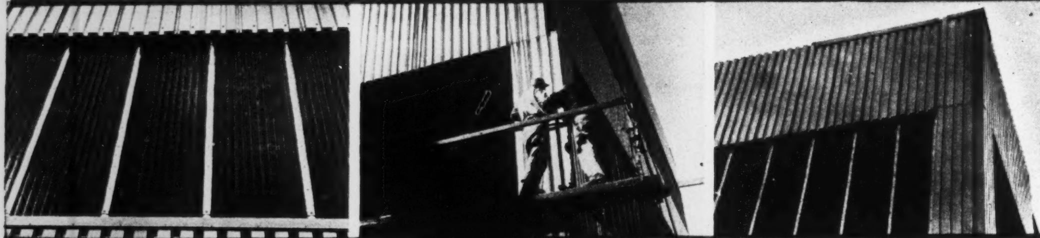


How long-lasting lightweight panels



were used to completely enclose



plant in eleven working days

STEP by step, these photographs show how U·S·S 17 (AISI type 430) Stainless Steel insulated building panels were installed on this addition to existing steam generating facilities at Olmsted Air Force Base, Middletown, Pa.

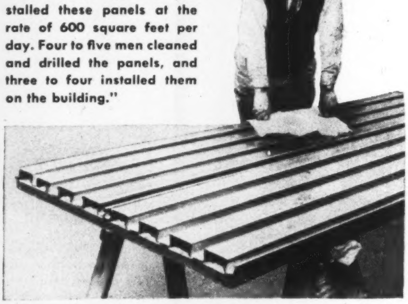
Only 11 working days were needed to bolt more than 7,000 square feet of panels to the structural framework. And that's only one of the advantages of this type of construction.

Panels of U·S·S 17 Stainless Steel give you a building with outstanding appearance, a minimum of maintenance and exceptionally long life. These benefits, plus the lightweight and low "U" value or heat transmission factor, make Stainless-paneled buildings the best answer to today's construction problems—especially since U·S·S 17 Stainless Steel is available without CMP tickets.

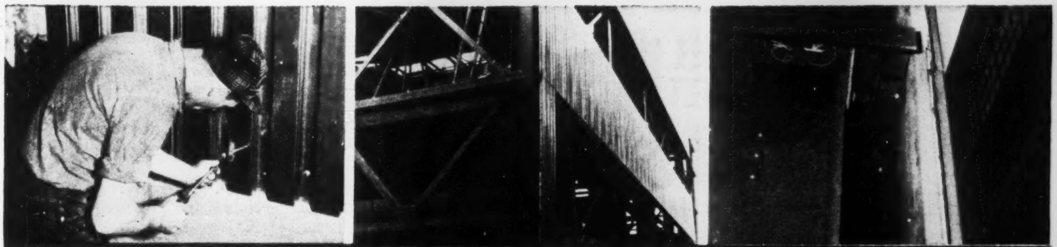
Get all the facts on this type of construction by mailing the coupon at the right.

Job Superintendent J. KALLEY says:

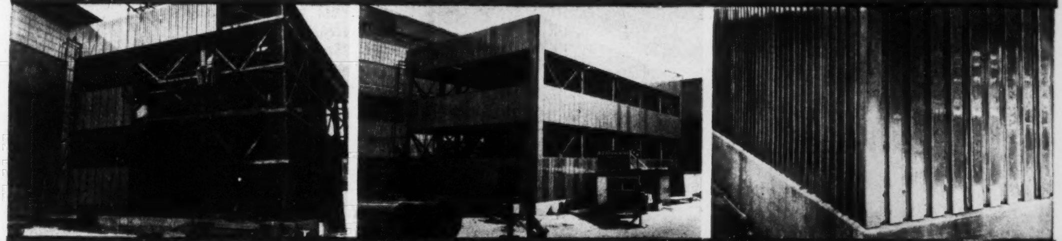
"Our crew of eight men installed these panels at the rate of 600 square feet per day. Four to five men cleaned and drilled the panels, and three to four installed them on the building."



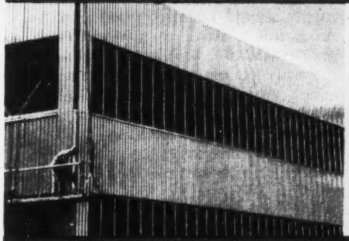
UNITED STATES STEEL

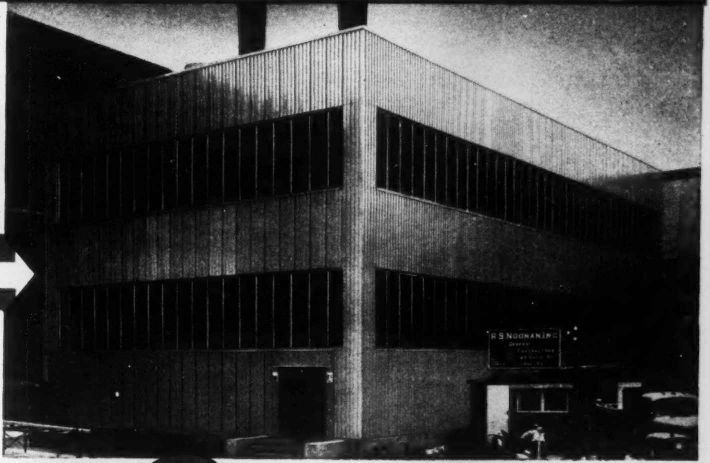


of U·S·S 17 (type 430) Stainless Steel



this 86½′ x 46′ steam generating





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during a hearing last January that under the previous regime V. A. appraisers and compliance inspectors made appraisals and signed completion reports without inspecting the properties.

Tagwerker had this comment on the joint committee investigation thus far:

"Due consideration must be given to the fact that our investigators found some complaints unjustified and in some cases it found minor defects were unreasonably emphasized and exaggerated.

"Items of a purely maintenance nature, which are normally the responsibility of any home owner were found in some cases to be the subject for complaint.

"This office has made no effort to persuade any builder, to meet demands that are considered unreasonable. We are in full sympathy with those veterans who are, and have been, suffering from improper construction due to the fault of the general contractor.

"In such cases we are exerting every effort to obtain proper corrective action. It should be understood that V. A. is not a party to a veteran's contract with the builder, and has no authority or legal right to compel a builder, against his will, to submit to the demands of a veteran.

"In justifiable instances we will intercede and attempt to persuade the builder to cooperate and make satisfactory adjustments and corrections."

Tagwerker said that the Anderson firm, at the committee's suggestion, inspected all of the houses in its tracts and performed repairs on about 50 on which no complaint had been made. In other cases, where Anderson felt that complaints were unjustified, he refused to do any repair work and received the backing of the joint committee in his decisions.

2 city departments fight for slum-clearance job

Los Angeles is currently arguing out the question of whether a slum rehabilitation program for the city should be put under one department—Building and Safety, or left in the departments where it now is—mainly Health.

Building and safety, headed by Gilbert E. Morris, maintains that all efforts should be centered in one agency, and that the logical agency is itself. Health, under Dr. George M. Uhl, maintains the various departments should continue to perform their normal functions, but on an en-

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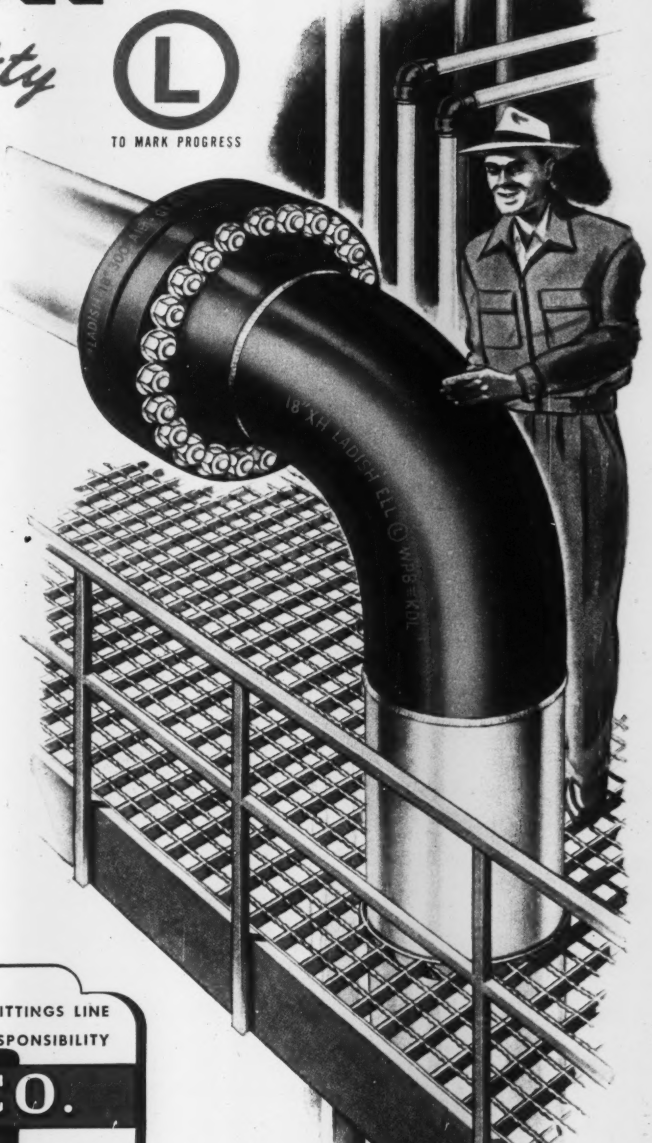

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Fact No. 1

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First cost—*the list price*—is less for a Chevrolet than for any comparable truck capable of handling the same payload. Chevrolet's position as the world's largest manufacturer of trucks makes possible production savings that are passed on to you.

Fact No. 2

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Proved Chevrolet truck features save money over thousands of miles. Time-tested Valve-in-Head engines, rugged hypoid rear axles, extra-sturdy channel-type frames, Flexi-Mounted cabs, Ball-Gear steering, Synchro-Mesh transmissions, all contribute to low operating costs with high dependability.

Fact No. 3

EACH TRUCK TAILORED TO ITS JOB

Every Chevrolet truck is *factory-matched* to the job it's going to do. Tires, axles, frame, springs, engine, transmission, and brakes are right for the operating conditions and load. Whatever your job is, there's a Chevrolet truck to fit it.

Fact No. 4

WORTH MORE AT TRADE-IN TIME

Chevrolet trucks traditionally bring more at resale than other makes costing about the same when new. Chevrolet trucks keep their value longer and give you real, substantial savings right up to the day you sell them. See your Chevrolet dealer soon.

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Faster loading, one-hand operation with trigger action, hairline accuracy controls, shorter, more compact design and other important features make the new RAMSET JOBMASTER the unmatched tool for high-speed, low-cost, effortless fastening into steel, concrete and other approved materials.

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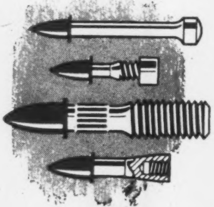

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larged scale and coordinated by a central administrative officer and a central advisory committee.

Inevitably, the argument has become involved with public housing. The most vociferous anti-housing councilmen are accusing opponent of the Building and Safety plan of attempting to sabotage any clean-up program that might weaken the case for public housing. They don't accuse Dr. Uhl of any such aim, but do say he is being "used." Dr. Uhl, naturally, rejects that idea and sticks to his central argument that slum clearance and public health are inseparable and that his department should continue to have the responsibility given it under the State Housing Act.

The Health Department has been giving somewhat belated publicity to a program about which it thinks it has a right to feel considerable satisfaction.

Without any extra compliment of inspectors or unusual appropriations, the department has chalked up accomplishments like this:

19,000 dwelling units brought up to standard in the past five years—a salvage job estimated at $95 million

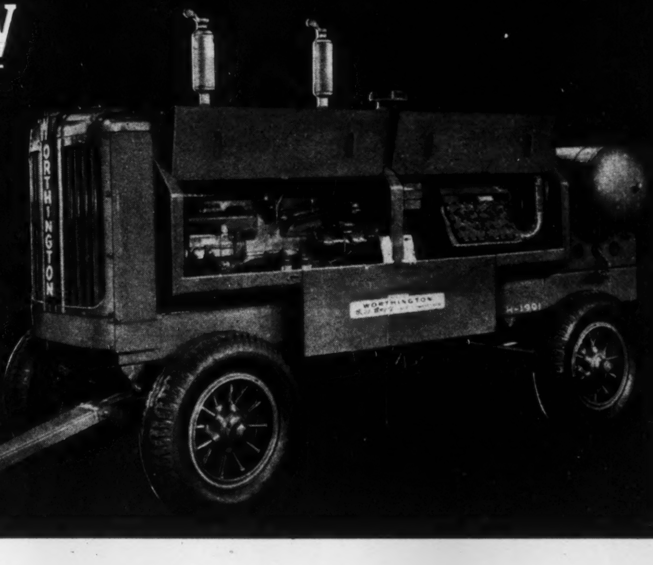
1,670 units vacated or reverted to original use, and 4,810 rehabilitated during 1951—for a salvage value of $24 million.

979 units vacated or reverted to original use during the first six months of 1952, and 5,880 rehabilitated, and 133 demolished.

The department doesn't claim to have rid Los Angeles of slums. The 1950 census showed 59,100 units of substandard housing in the city, about the same as in 1940. But during that period Los Angeles' population increased from 1,504,277 to 1,970,358, and industrialization has gone on at a phenomenal rate. Even to have held the line under those conditions—which is all the department claims—is no small accomplishment.

Slum prevention and rehabilitation has been primarily the Health Department's job because of the State Housing Act of 1917. This act provides that building departments of California cities shall enforce all provisions relating to erection, construction, reconstruction, movement, conversion, alteration, or arrangement of apartment houses, hotels and dwellings. It gives to the "housing department, or, if there is no housing department, the health department of every city," responsibility for enforcing "all provisions pertaining to maintenance, sanitation, ventilation, use, or occupancy" of such buildings.

It's the NEW Blue Brute 600' portable air compressor



A *BIGGER* Compressor for your air tools

Here it is . . . biggest and most powerful of all Blue Brute Portable Compressors! This 600' unit *really* costs less to operate, with its *low* fuel consumption and the *minimum* maintenance it calls for.

Just check these Worthington features it incorporates:

Air-operated fuel-saver control that keeps fuel consumption way down (never a pound of unnecessary air pumping, automatic unloading at idling speeds, engine speed in ratio to air requirements) . . . hydraulically controlled clutch for really easy operation . . . identical stack-type, oil-bath air cleaners on engine and compressor for easy servicing . . . two full-length tool boxes with ample capacity . . . two-piece side panels for better temperature control and easy handling by one man . . . unit core radiator and intercooler, offering maximum cooling surface . . . frame protected fuel tank for easy, low level filling . . . three-point engine and compressor mounting . . . formed steel channel frame, semi-elliptical spring mounting and automotive-type steering.

There's even more you'll want to know about this new portable compressor. Write for Bulletin H-850-B74 to Worthington Corporation, Construction Equipment Division, Plainfield, N. J.

ENOUGH AIR IS LEFT OVER in this hookup with the new Blue Brute 600' and with two 4-inch wagon drills to operate the heavy-duty rock drill in foreground!

H.2.4

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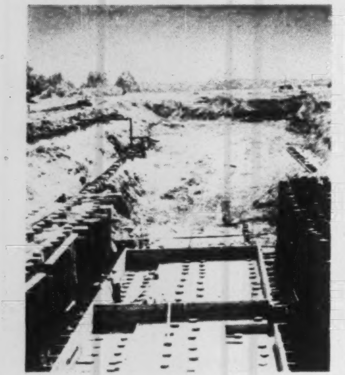

WELLPOINT ENGINEERS LICK MARSH AREA PROBLEM

Picture a river nearby . . . a subtropical site so marshy that the ground shook like jelly beneath the machines. To these obstacles, add a water table almost at surface and, farther down, some layers of muck 2 to 3 ft thick.

• Such was the problem pitched at Griffin engineers and here are the answers they returned, with a carefully planned 2-stage wellpoint system. (1) Foundations go in quickly, as deep as 22 ft below water level. (2) Over 22,000 cu yds of earth move out economically, by dragline. (3) Subgrade is so bone-dry that the 1800 timber piles are driven with pile rig working from bottom of excavation.

• When a job calls for "know-how," call for Griffin, dewatering experts for nearly two decades.

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MEN AND JOBS

PERINI WATCHES A BALL GAME with one of his partners, also a well-known contractor, C. J. Maney, right, of Boston.

Perini likes the big leagues

Louis R. Perini was born in Framingham, Mass., on Nov. 29, 1903. He started in his father's construction enterprises as a water boy. Along with his brothers, he worked at various other construction jobs with the firm, when not attending school.

His accession to the presidency of B. Perini & Sons, Inc. came with startling suddenness.

In 1924, his father died. Lou, only 21 years old, became president of the firm. His brothers, Joseph, Charles, and Alfred took other posts, and they struggled to manage the organization that had so suddenly become their responsibility.

Then Lou Perini walked into a $350,000 bridge construction contract near Boston.

It was a small contract compared with the firm's most recent: A $3.5-million award for housing at the Limestone, Me., air base. It would be insignificant compared with the $51-million Niagara power project, where Perini is the sponsor in a joint venture. But it was big for Perini in 1924: it launched him into the big leagues of the construction industry. Last year his firm did a business volume close to $40 million.

• **Enterprise grows**—By 1933, B. Perini & Sons, Inc., under the guidance of Lou, had completed many large road building projects in the eastern states. Like many contractors in that period following the depression, Perini entered the heavy construction field where public works were keeping the construction industry alive.

"The decision to branch out was a gamble for the company," says Perini, "but in rapid succession we were successful in building such projects as the core wall of the Windsor Dam, the Murphy Dam, the Caleb Mills Saville Dam, Birch Hill Dam, Cape Cod Canal widening, Park River conduit for the City of Hartford, Conn., Tuscarora Tunnel on the Pennsylvania Turnpike, and the Merriman Division Tunnel for the Board of Water Supply, New York City."

During World War II, Perini branched out into strip mining and deep coal mining, and at one time was operating 18 mines and produced five million tons of coal. At the end of the war, as demand dropped, the company withdrew from its mining activities and concentrated on the huge post-war building program. Recalling these war years, Perini is particularly proud of the construction at the Letterkenny Ordnance Depot in Pennsylvania.

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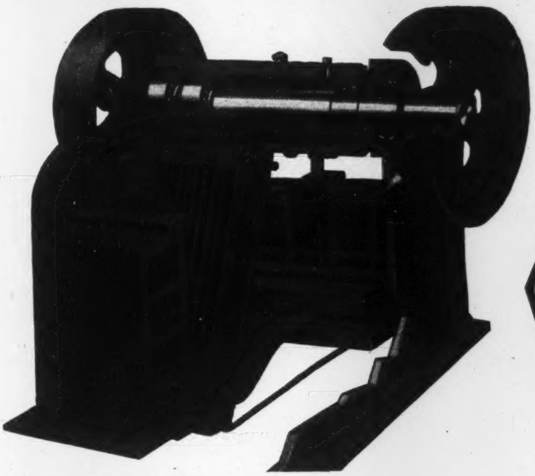


Cutaway Series "WRB" Welded Steel Plate Roller Bearing Jaw Crushers

HERE'S WHY UNIVERSAL JAW CRUSHERS ARE THE MOST EFFICIENT OVERHEAD ECCENTRIC JAW CRUSHERS MADE

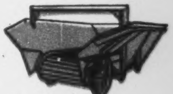
Universal's famous 1-2 action, the *original* overhead eccentric action, produces two distinct crushing blows with each revolution of the eccentric shaft. One blow at the top of the jaws, the other at the bottom. The high overhead eccentric combined with the radial toggle action *engineered* into each Universal jaw crusher provides a downward crowding motion resulting in force feed. The steep angle of the toggle plate gives more kick to the movable jaw providing an easy discharge of material. This is the Universal overhead eccentric principle which gave Cedar Rapids, Iowa, its original fame for quality crushers.

The overall design of the Universal jaw crusher produces a better angle of nip, a larger ratio of reduction, a faster discharge of material, and a long life. You can't beat a Universal for top capacity and guts to stay on the job.

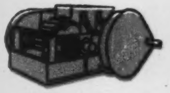
For top crushing performance buy Universal . . . the industry's *first* and the industry's *finest* overhead eccentric jaw crushers. Made in a complete range of sizes for your every need.

Write for Bulletins

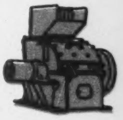
Profit with UNIVERSAL HIGH PRODUCTION BASIC UNITS



Apron Feeders

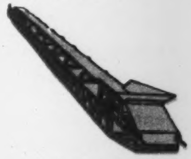


Roll Crushers

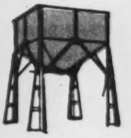


Hammermills

Screens



Conveyors



Bins

UNIVERSAL ENGINEERING CORPORATION Division of PETTIBONE MULLIKEN CORPORATION

633 C Avenue N.W., Cedar Rapids, Iowa
Phone 7105

4700 West Division St., Chicago 51, Illinois
Phone Spaulding 2-9300

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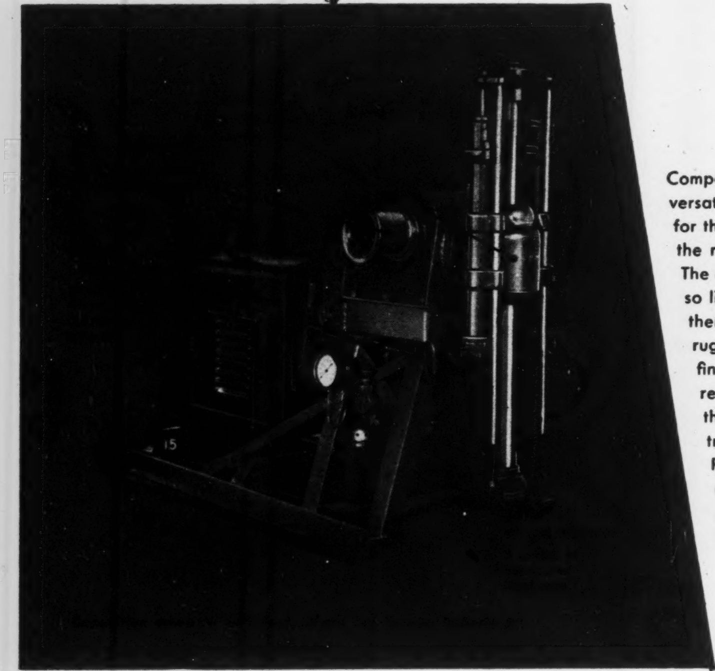
HAMMERMILL
HAISS
UNIVERSAL

MOUNT IT-POWER IT-USE IT *Anywhere!*

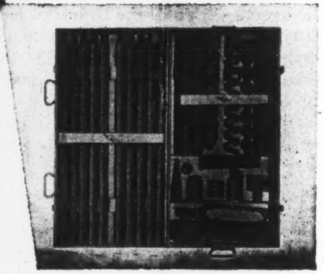
THE NEW VERSATILE ACKER TEREDO SHOT CORE DRILL



Compactness — dependability — versatility are a few of the reasons for the ever increasing popularity of the new Acker Teredo.

The essential parts of the Teredo are so light and compact you can carry them by plane or muleback — so rugged and dependable that you'll find Teredo's drilling in the most remote operations — so versatile that Teredo's are mounted on drags, trucks, jeeps, trailers and bulldozers. Power can be either, air or electric motor, gasoline, kerosene or diesel engine, or powered direct from jeep, truck or bulldozer.

Acker Soil Sampling Kit A portable kit containing all the necessary tools for accurately testing and recovery of samples of sub-soil conditions. →



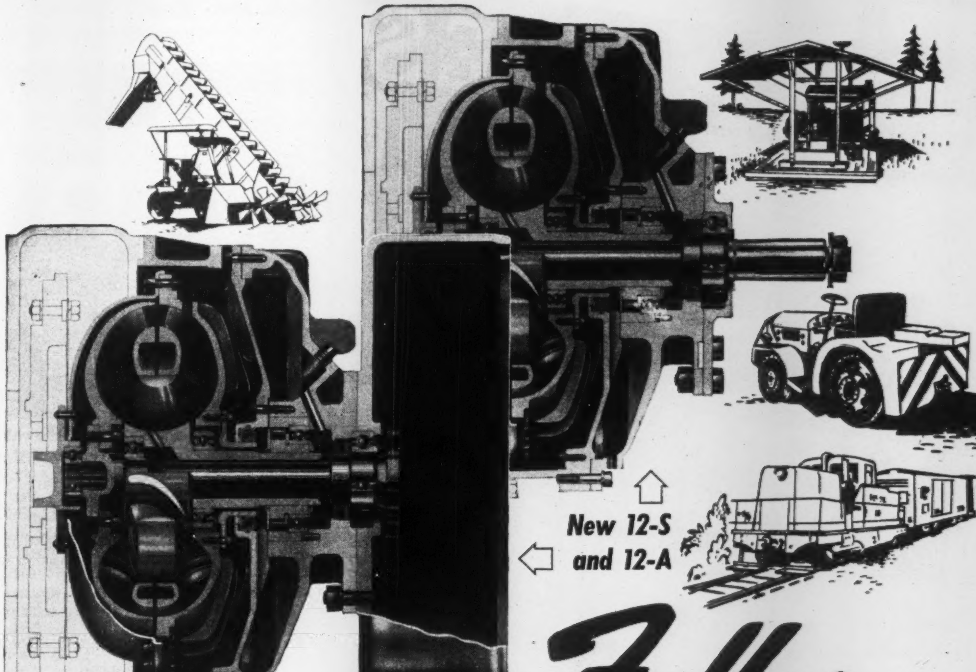
Accessory Drill Equipment The Acker Drill Company carries a complete line of drill equipment, supplies and fittings. Write us about your problem.

Free! Soil Sampling Catalog—This complete, instructive collection of information about soil sampling in all subsurface conditions, shallow or deep, with hand or power driven tools, is yours for the asking. Ask for Catalog 25-ENR.

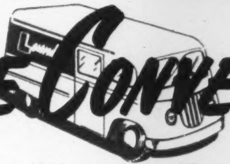
OVER 30 YEARS EXPERIENCE IN THE MANUFACTURE AND DEVELOPMENT OF DRILLING EQUIPMENT

[redacted] SCRANTON 3, PENNA.

25 BRANCHES THROUGHOUT THE WORLD TO SERVE YOU



Fuller
TORQUE CONVERTER COUPLINGS



Operators now have at their command a new torque converter coupling for engines delivering maximum torque of 180-225 foot pounds. Fuller's new 12-A and 12-S converter coupling drives have proved highly successful in delivery trucks, fork-lift trucks, tow trucks, hoists, locomotives, loaders and other installations where start-and-stop, heavy load pickups are hard on engine, gears, drive lines, axles and tires, and tiring on operators.

Specify these advantages for *your* new and repowered equipment . . . 2.1 to 1 torque multiplication . . . elimination of shock loads and stalling . . . greater operator ease.

Available with *splined* output shaft (12-S) or with *flanged* output shaft and SAE No. 3 flywheel housing (12-A). Multiplication 2.1 to 1 at stall for smooth starting and hard pulling. Stator mounted on over-running clutch which permits automatic change to fluid coupling operation for economy in normal running. Maximum diameter of fluid circuit 12¾″. Designed for engine speed of 2000-2200 and higher.

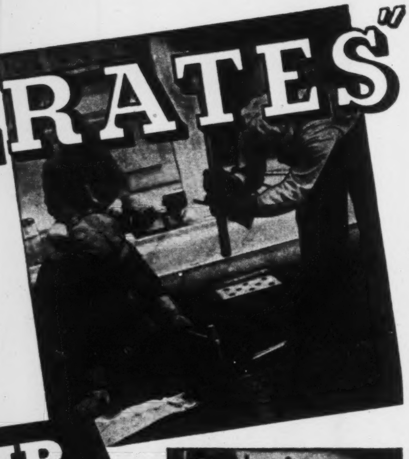
Ask for an analysis by our engineering department for *your* application, giving engine torque and hp. curve.

- ● SPEEDS WORK
- ● SMOOTHS POWER
- ● PREVENTS SHOCK
- ● PLEASES OPERATORS
- ● PRESERVES EQUIPMENT

Fuller TRANSMISSIONS ®

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO 13F, MICHIGAN

Unit Drop Forge Division, Milwaukee 1, Wis. • WESTERN DISTRICT OFFICE (SALES & SERVICE—BOTH DIVISIONS), 1060 E. 11th Street, Oakland 6, Calif. •



5 "GRATES"

for hundreds of construction applications

with KLEMP Metal Gratings

to

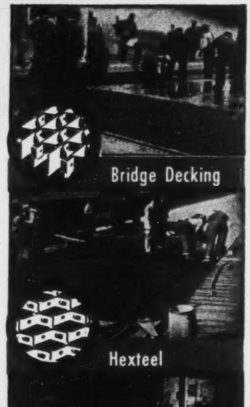
- Protect against floor wastes
- Reinforce all concrete surfaces
- Insure fireproof, non-slip footing for men and traffic
- Insure efficiency with safety
- Insure protection, plus comfort through complete ventilation

The Klemp Metal Grating Corporation has been serving the needs of contractors, civil engineers and public works officials for almost half a century. During this time, Klemp has produced and patented several specialized gratings, such as Hexteel and Floorsteel.

Klemp's engineers have exclusively specialized in the fabrication of gratings, such as Hexteel Surface Armor and Floorsteel Flexible Floor Armor for reinforcement of all surfaces where concrete or mastic are applied. In addition, they have developed a bridge decking which is the most up-to-date flooring for modern bridges . . . prefabricated to exact specifications.

Klemp's diamond riveted and welded gratings are ideal for foot and plant material traffic wherever rugged strength is needed in structural footwalks, stair treads and open steel flooring.

We solicit the opportunity to let Klemp's engineers help solve your most difficult grating problems. Send in your blueprints for quotations today. All types of Klemp Gratings are available for immediate shipment.

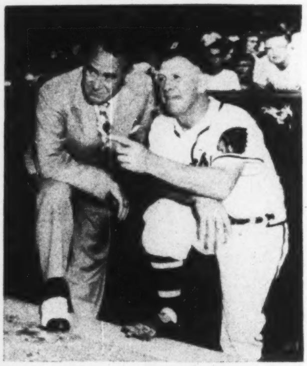


We Tread the World with Safety

KLEMP
METAL GRATING
CORPORATION

Executive Offices: 1371 N. BRANCH ST., CHICAGO 22, ILL.
Plant: 6601 S. MELVINA AVE., CHICAGO 38, ILL.

MEN AND JOBS



LOU PERINI talks things over with Charles (Cholly) Grimm, Manager of the Boston Braves.

"It was during the years 1942-43," said Lou. "The job was one that was urgently needed and we were asked to go all out to finish it. The men worked day and night, and I remember during one phase of the construction the heat was almost unbearable. Men were dropping at their jobs from exhaustion, but not once during the entire time did one of them complain, every one of them realized what the job meant, and many had sons and daughters in the service. I believe that job was the most gratifying one I ever engaged in, so far as overall effort was concerned."

Also during the war, the company completed contracts at Camps Edwards, Shanks and Ritchie, at the Earle Navy Depot, and civilian contracts at airports in Maine, Massachusetts, Maryland and West Virginia.

• **New business**—Following the war, Lou Perini joined with C. J. Maney and Guido Rugo, two other contractors, and purchased the Boston Braves baseball club. The Boston Press dubbed them "the three little steamshovels."

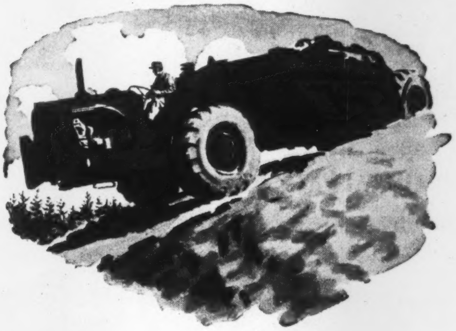
As president of the club, Lou Perini poured some of the same energy into running the club that he had used to build his contracting business. First move was to acquire the services of one of the National League's most successful baseball managers, Billy Southworth. In three years, the "three little steamshovels" had scooped the Braves out of the Second Division, and pushed them to the 1948 National League Pennant.

Guiding the destiny of the Braves and their far-flung Minor League

(Continued on page 268)

Men who depend on power... know they can depend on CUMMINS®

Every CUMMINS DIESEL is built not once but twice



Construction men in the field have learned to count on Cummins Diesels for dependable power day in, day out.

What's behind this consistent reliability? One good reason is the fact that every Cummins Diesel is actually built *twice*. After initial assembly, and run-in testing, every engine is disassembled, inspected; then reassembled and tested again.

This extra care—together with Cummins' economy-proved fuel system and efficient parts and service organization—makes lightweight, high-speed (50-550 h.p.) Cummins Diesels a wise first choice *for men who depend on power*.

Whatever your power needs . . . whether it's for earthmoving, portable power units or generator sets . . . or any other important jobs . . . your Cummins dealer is the man to see.

CUMMINS ENGINE COMPANY, INC., Columbus, Indiana

Export: Cummins Diesel Export Corporation
Columbus, Indiana, U.S.A. • Cable: CUMDIEX
(C-81)

CUMMINS DIESEL

TRADEMARK REG. U. S. PAT. OFF.

Leaders in lightweight, high-speed diesel power!

Get the Right Equipment

FOR THE JOB!

THE RIGHT EQUIPMENT can save you a lot of time and money. You'll find that this Fruehauf Dump Trailer is built for capacity loading, top stability, and extra-long service. Yet it's *competitively* priced!

The chassis for this unit is *specially* built of ⅜ inch stock, with a powerful, trussed frame 15⅞ inches in depth behind the gooseneck. Flanged crossmembers at key points absorb hazardous road stress. The lightweight, high-tensile steel body is strongly reinforced by channel cross sills, I-beam longitudinals, and full-length rub rails.

Some extra features that make this the most efficient package dump Trailer you can buy are the two-speed Fruehauf supports, top and bottom hinged tailgate, and 6 inches of extra inside width. Fruehauf's *full* line of dump units also includes chassis, tandems, and specials, built to specifications—and built *right!*

World's Largest Builders of Truck-Trailers
FRUEHAUF TRAILER COMPANY
DETROIT 32, MICHIGAN

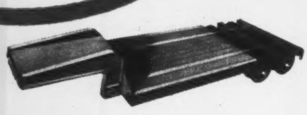
Fruehauf Dump Trailer
Model Y514-8
8⅓—15½ Cubic Yards

YOU'LL SAVE if you give your Fruehauf representative a chance to survey your hauling needs and enter a bid. Or contact your nearest Fruehauf Branch for the free, illustrated catalog of Fruehauf's *full* line of Trailers.

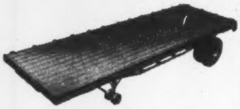
FRUEHAUF
Trailers
"ENGINEERED TRANSPORTATION"

A FRUEHAUF ALWAYS DOES THE JOB *BEST!*

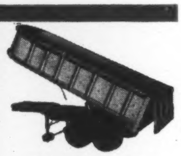
DUMP CHASSIS



CARRYALLS

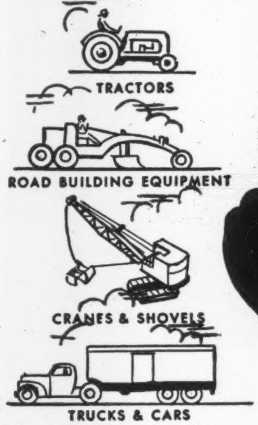


PLATFORMS



TANDEM DUMPS

where it pays to be tough...



...extra toughness pays

specify *Lamson* CAP SCREWS

Where the going's roughest ... when the job's the toughest ... that's the spot where the famous Lamson 1035 Hi-Tensile Cap Screws really show their stuff.

The best-known manufacturers of heavy farm, road-building and construction equipment choose Lamson Cap Screws as original equipment. That's the best recommendation you could have for specifying Lamson Cap Screws for use in all repair and rebuilding work.

Lamson + Sessions

The LAMSON & SESSIONS Co.
1971 West 85th St. • Cleveland 2, Ohio
Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

Check the products below that interest you; tear off bottom of ad and send to us for complete information.

HI-TENSILE CAP SCREWS
"1035" Heat Treated Steel.

WIRE ROPE CLIPS
Hi-center saddles, extra-strength U-bolts.

PIPE PLUGS
Forged steel, heat-treated.

COTTER PINS
Steel, brass, aluminum and stainless steel.

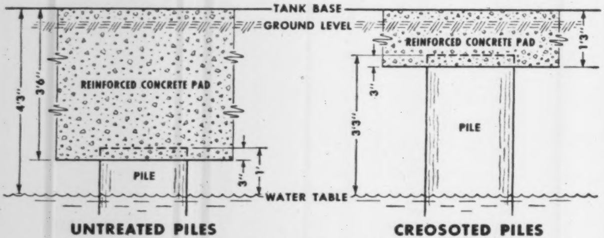
LOCK NUTS
Economical, vibration proof. Can be used repeatedly.

"BENT BOLTS"
Including U bolts, eye bolts, hook bolts, etc.

TRACTOR BOLTS
Made to manufacturers standards.

SQUARE AND HEX MACHINE SCREW NUTS
Semi-finished, hot pressed, cold punched.

$33,000 SAVED
with Pressure-Creosoted Piles!



Alternate methods of supporting large storage tanks

...another example of the economy of using Koppers Pressure-Treated Wood

At the Williams Plant in Port Arthur, Texas, foundations were recently installed for six large storage tanks. These tanks are on ground that is slightly above the permanent water table. Under such conditions it is common practice to use *untreated* timber piles for foundations.

But *untreated* piles, as shown above, may require a *thick* pad of concrete—and that runs into real money. This thickness of concrete may be necessary because untreated piles cannot be cut off any higher than one foot above the permanent water table; otherwise they are vulnerable to decay and insect attack.

Koppers *Pressure-Creosoted* Piles, on the other hand, are fully protected against decay and insects . . . they can be cut off *at any point above the permanent water table.* A thinner pad of concrete is all that's needed—and the costs are much lower.

That's why the Williams' tanks were founded on Koppers Pressure-Creosoted Piles. The estimated savings in material and labor, based on Gulf Coast prices, are set forth below. These figures cover all six storage tanks—five tanks with a capacity of 500,000 gallons each, and one tank with a capacity of 1,500,000 gallons.

Comparative Costs

USING UNTREATED PILES		USING CREOSOTED PILES
1,479	Number of Piles	1,320
35'	Length of Piles	35'
2,610	Cu. Yds. of Concrete	930
3'6"	Pad Thickness	1'3"
61.95	Tons of Reinforcing Rod	61.95
1,930	Cu. Yds. of Excavation	432
$180,850	Total Cost	$147,338

$180,850
147,338
Savings—$33,512

Use of untreated piles would have increased foundation costs by 22.7%.

Pressure-creosoted piles are now accepted in most modern building codes for permanent construction. Write for further information and quotations.

KOPPERS COMPANY, INC., PITTSBURGH 19, PA.

KOPPERS PRESSURE-TREATED WOOD

MEN AND JOBS

CONSTRUCTION BUSINESS and baseball keep Perini close to a telephone.

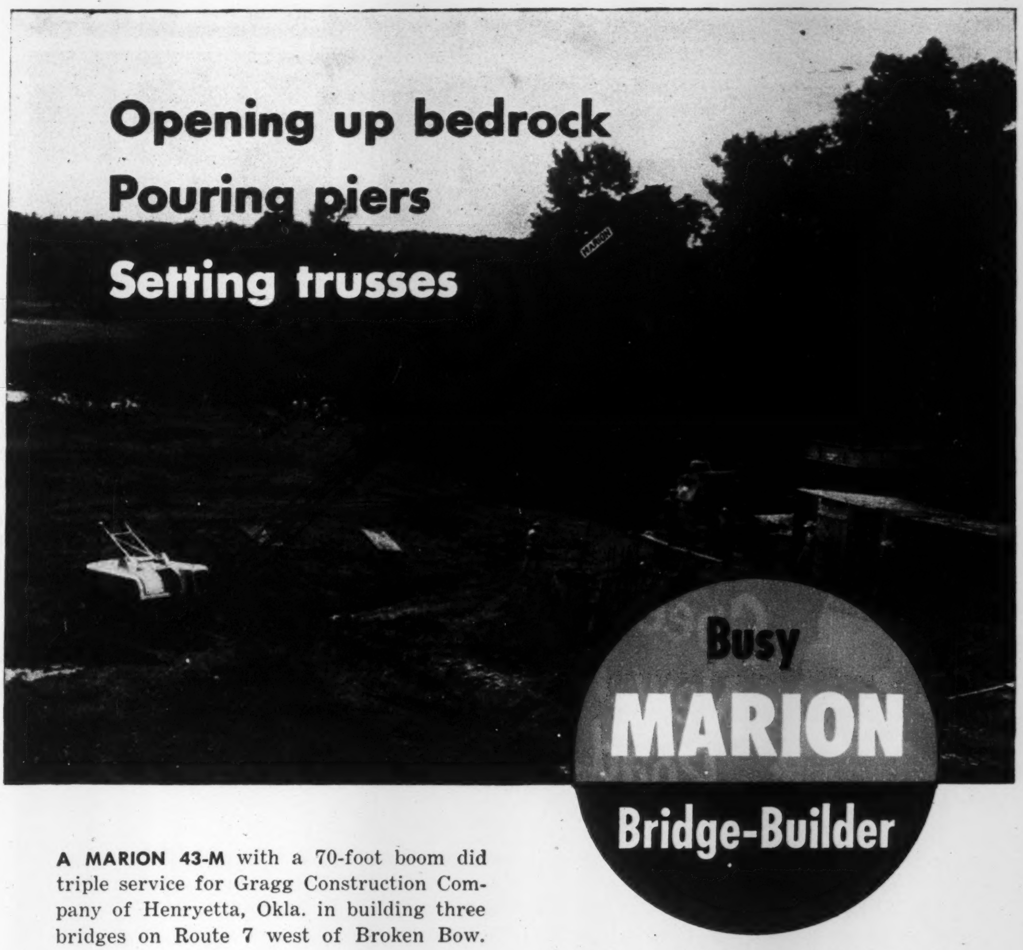
holdings hasn't been "all fun" for Lou, but he is determined that the Braves shall again fly the championship pennant—even though they are currently back in the Second Division again.

• **Looking ahead**—Perini feels that the increasing use of machinery—particularly new and greater earth-moving equipment, is the greatest advance in the construction field. He sees construction resulting from development of atomic energy as the big promise for the industry in the future.

"Projects today are so vast that it would be almost impossible for one firm to fulfill a contract. The B. Perini & Sons firm has banded together in joint ventures, and has pooled its resources with other firms—such as: Walsh Construction Co., Morrision—Knudsen, Kaiser, Peter Kiewit Sons' Co., Arthur Johnson, Tompkins, J. A. Jones, S. J. Groves and others.

"During the past five years our company has been the actively managing company or substantially interested in such large projects as the Downsville, N. Y., core wall, $13 million; Delaware aqueduct tunnel, $44 million; Squirrel Hill vehicular tunnel in Pittsburgh, $15 million; Jim Woodruff Dam, lock and powerhouse, $24 million; Clark Hill Dam, $26 million; Sir Adam Beck hydraulic tunnel, Niagara Falls, Canada, $24 million; the Morrisville, Pa. Fairless Works for U. S. Steel, $50 million; Chief Joseph Dam power plant, $40 million; Toronto, Canada subway $15 million and considerable building work.

With his business grown nationwide, Perini took up flying to cut down on his traveling time and flies his own plane to visit projects from Florida to Canada.



A MARION 43-M with a 70-foot boom did triple service for Gragg Construction Company of Henryetta, Okla. in building three bridges on Route 7 west of Broken Bow.

AS A DRAGLINE, the 43-M cleared away earth and shale to provide bedrock foundations for piers and abutments.

WITH A CONCRETE BUCKET, the 43-M poured footers, piers and abutments on the multi-span project.

AS A CRANE, the 43-M and a companion machine, a MARION 331, swung pony truss sections into place.

Many incidental crane and dragline jobs were performed by these Marions along with these major assignments.

The key men in the Gragg organization are experienced contractors. Their skillful use of the many abilities of MARION machines has helped them do many jobs ahead of schedule.

Let your nearest MARION Distributor tell you how MARION machines can help get your jobs done quickly, dependably and economically.

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

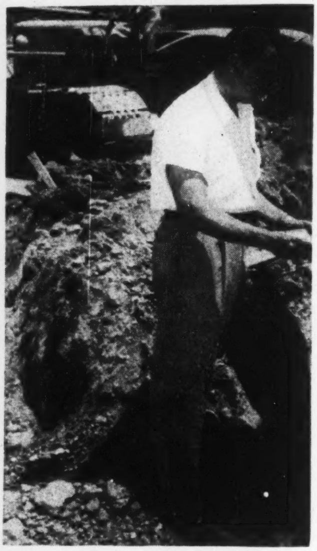
from ¾ cu. yd. to 45 cu. yds.

ELLICOTT DREDGE
Speeds New Jersey Road Job!

DELIVERING an average of more than 4,000 cu. yds. of solids per working day, this big Ellicott 12″ hydraulic dredge saw plenty of action on a recent New Jersey road project. A total of 250,000 cu. yds. of wet material was removed, then 600,000 cu. yds. of approved fill was deposited for the road bed. Job report reads: "The project, which required the dredge to be moved overland from one site to another several times, was completed in just 8 months!"

Ellicott dredges are built for long-range, profitable service under all types of conditions . . . built to *outperform all others on every basis!* For more information, write for Catalog 825. Address: ELLICOTT MACHINE CORPORATION, 1603 Bush Street, Baltimore 30, Md.

ELLICOTT ®
ELLICOTT DREDGES



MARVIN WARNER, partner in the building team of Warner-Kanter.

$30-million business built in 6 years

In 1946, a partnership was started with $6,000—today it controls housing developments estimated to be worth more than $30 million.

That's the story of Joseph H. Kanter and Marvin L. Warner—a story of opportunity in America.

In 1946, Warner at 27 and Kanter only 22, returned from the wars.

Warner got into building first. He came home from the Army to his wife, Jane, a daughter, Marlin, and, like many other veterans, no place to live. Marv Warner decided to do something about it.

He rounded up his savings, obtained an FHA insured loan and built a 10-unit apartment. Joe Kanter, a bachelor, also noting that veterans suffered "living with the in-laws", also obtained an FHA loan and built an eight-unit apartment.

Selling insurance at the time, Warner paid a visit to Kanter in hopes of selling a policy on the apartment building. The deal completed, both interests lead to housing as a career and the Warner-Kanter partnership was formed.

The first job was a 24-unit project at Birmingham, Ala., their home town. Next came Washington Park, a negro rental development in Birmingham's Acipco district.

(*Continued on page* 274)

Left: On the Covington job, both haul and return roads are pitched at angles varying between 30% and 40%.

Hauls 18 yards of rocky clay over 30% grades

quickly and safely — trip after trip with Heiliners!

Above: Large rocks in the clay soil give the Heiliners plenty of chance to show that they are built to "take it."

Fischer Construction Co., Cincinnati, Ohio, is being put to a real test on this Covington, Kentucky housing project. And so is their earthmoving equipment. Clay is rough and rocky — and there are 220,000 cubic yards of it to move. The terrain is hilly. Haul and return roads are critically pitched. But four Heiliners are helping this contractor come through with flying colors.

Every 10-hour day, each of these four Heiliners hauls heaped 18-yard loads every 7½ to 8 minutes—an average of 144 cubic yards per hour. Each machine loads in about a minute and a half; takes about six minutes to make the half-mile round trip. They haul down a steep road with grades up to 30%; fill and spread; then return up a road that has a pitch up to 20%.

Tough going like this is "duck soup" for a Heiliner operator. Here are just some of the reasons why: Exclusive patented *Hydro-Steer* assures safe steering. *Hitch-post* design eliminates shimmying. *Cummins Diesel engine* provides plenty of power. Heavy-duty *air brakes* give complete control.

Have your Heil road-machinery distributor give you the complete Heiliner story — and demonstrate the model that meets your needs: The Series 800 Heiliner — with 18-cu. yd. scraper and 20-cu. yd. dump wagon. Or the Series 500 Heiliner, 13-cu. yd. scraper — the economical size for maintenance, stockpiling, and other earthmoving jobs.

Ask for free Heiliner bulletins.

R-134

Tear out coupon and mail today!

DEPT. 192, 3001 WEST MONTANA STREET, MILWAUKEE 1, WIS.
Send me Heiliner Bulletins RM-50008A and RM-51002.

Name……………………………………
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Company……………………………………
Company Address……………………………………
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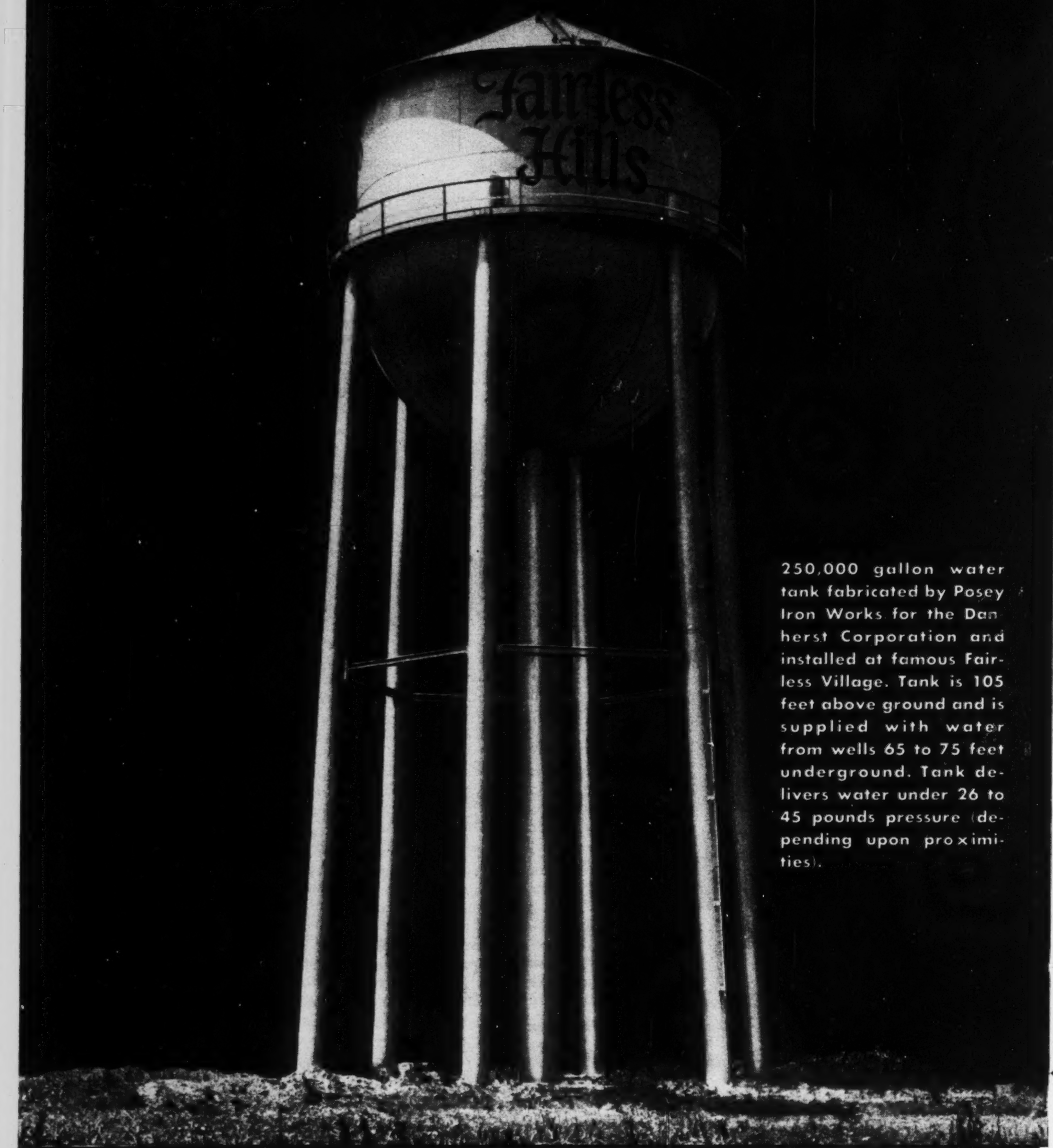
THE HEIL CO.

THE HEIL CO., Dept. 192, 3001 W. Montana St., Milwaukee 1, Wis.
Factories: Milwaukee, Wis., Hillside, N. J.
District Offices: Hillside, Washington, D. C., Atlanta, Milwaukee, Detroit, Chicago, Kansas City, Dallas, Los Angeles, Seattle

IT PAYS [illegible]



250,000 gallon water tank fabricated by Posey Iron Works for the Danherst Corporation and installed at famous Fairless Village. Tank is 105 feet above ground and is supplied with water from wells 65 to 75 feet underground. Tank delivers water under 26 to 45 pounds pressure (depending upon proximities).

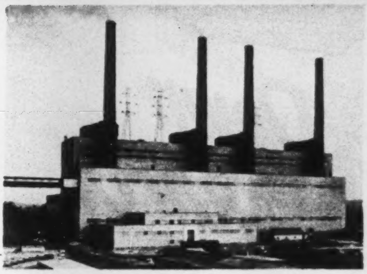
POSEY IRON WORKS, INC.

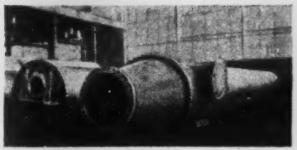
Steel Plate Division

LANCASTER, PENNSYLVANIA

(and Firms of all Sizes) to follow THIS Trend in CONSTRUCTION COSTS

Battery of storage tanks fabricated by Posey Iron for American Liquid Gas, Inc., and used by Nash-Kelvinator Corporation.


These four Posey Iron stacks measure 23′ diameter by 12′6″ diameter by 192′6″ high.


72″ diameter headers for use on water intake lines. Fabricated throughout in the Posey Iron shop for export.

Posey Iron Works is helping large and small companies to follow *this* trend in construction costs: To purchase steel plate structures at prices that cover specifications plus adequate safety margins . . . but which are *reduced* by these 4 cost factors:

1. *PRACTICAL Engineering*. Posey Iron engineers are men with long experience in practical structure design. They give problems of loads . . . pressures . . . reserve capacities . . . pumping costs . . . the most economical solutions consistent with safety.

2. *Ample Shop and Erection Facilities*. Posey Iron shops cover 16½ acres under roof and include an up-to-the-minute machine shop and a well equipped foundry. On Posey Iron jobs, costs are never increased and deliveries never delayed because work must be "shuffled" from one firm to another.

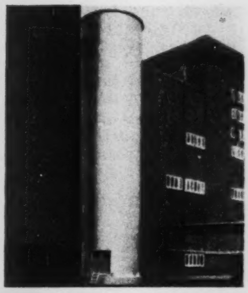
3. *Modern Equipment*. Recent plant expansion gives Posey Iron cost advantages. Included in Posey's shop equipment are a 32-foot roll for bending plate . . . 16-foot power brake for ½″ steel plate . . . 50-ton crane with 27-foot headroom . . . 16′6″ vertical boring mill . . . 30′ x 94″ (dia.) lathe.

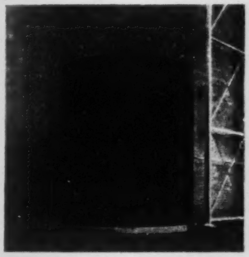
4. *Case History Files*. Yes—case history files are a BIG cost factor! Accumulated over the company's 42 years of experience, Posey Iron's files are invaluable indexes to money-saving routing of production and selection of materials.

Posey's case is proved by Posey's bids. A discussion of your requirements in no way obligates you.

Our products are designed and built to comply with the requirements of the ASME; API-ASME; API and other codes and we are authorized to apply the appropriate Code Symbols.

PRODUCTS: Autoclaves—Barges—Bins—Butane-Propane Tanks—Condensers—Digesters—Dredge Hulls and Pipe—Dryer Shells—Elevated Tanks (Steel and Alloy Steel)—Fabricated Steel Plate—Gas Holders—Kilns—Pressure Vessels—Retorts—Stacks—Stand Pipes—Stills—Storage Tanks (Steel and Alloy Steel)—Welded and Riveted Pipe—Wrought Iron, Steel and Alloy Steel Pipe.


Posey Iron wrought iron salt cake silo installed in a leading pulp mill.


One of Posey's many installations for the paper industry—a black liquor tank for handling highly corrosive liquid.

New York Office: Graybar Building **Established Since 1910**

Straight Down to Paydirt!

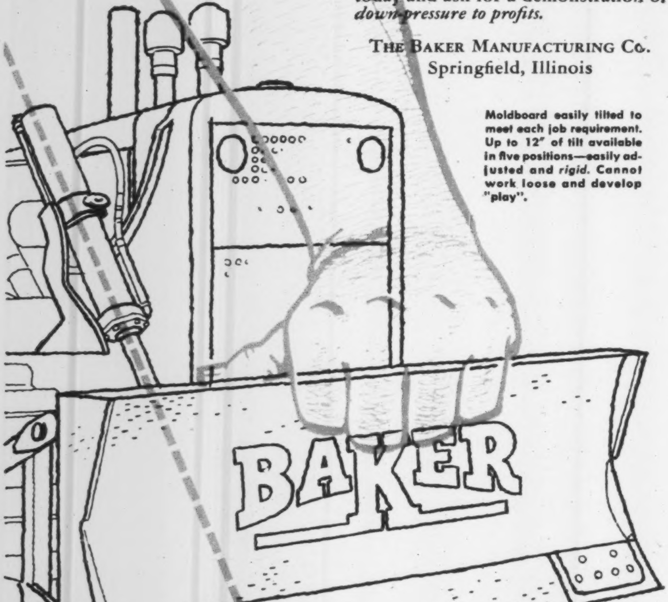
Designed for maximum down pressure through toughest conditions, Baker Hydraulic Blades *go down positively* and *stay down positively*—with the exact bite desired—fingertip-controlled by the operator.

Regardless of blade tilt or angle, Baker's superior design provides *straight-line force* through hydraulic cylinders to blade—permitting nearly entire weight of tractor to force blade *straight down to pay dirt!*

The versatile line of Baker Bulldozers, Gradebuilders and Root Rippers—*all interchangeable*—is manufactured exclusively for Allis-Chalmers tractors. Three mountings are available: Engine-mounted hydraulic; frame-mounted hydraulic (the revolutionary 9-X "no-pushbeam" 'Dozer), and cable-controlled types.

Contact your Baker, A-C Deale. today and ask for a demonstration of *down-pressure to profits.*

THE BAKER MANUFACTURING CO.
Springfield, Illinois



Moldboard easily tilted to meet each job requirement. Up to 12" of tilt available in five positions—easily adjusted and *rigid*. Cannot work loose and develop "play".

Baker—The most versatile line of tractor attachments

JOSEPH KANTER, the other member of the team which has a $30-million business.

• **Operations**—Operations really began rolling at this point. Birmingham's First National Bank backed them, and soon several insurance companies were putting up money.

After building projects in their home town, the youthful builders ventured into St. Louis and tackled an 844-unit, $9-million project.

Next was a 14-story building in downtown Indianapolis that involved expenditures in excess of $4 million.

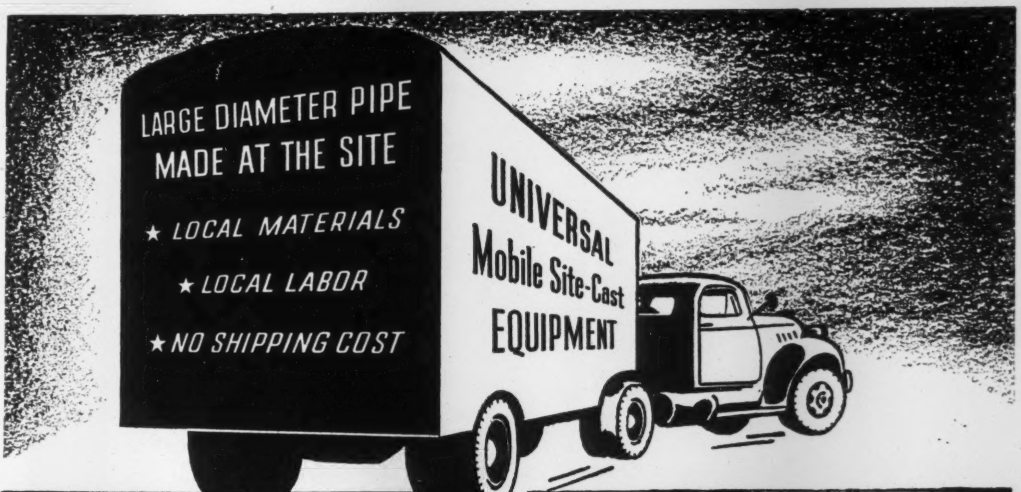
Noting that Cincinnati was getting more and more new industry, the Warner-Kanter team went there in a rush. They started the $3.5 million Canterbury Gardens project.

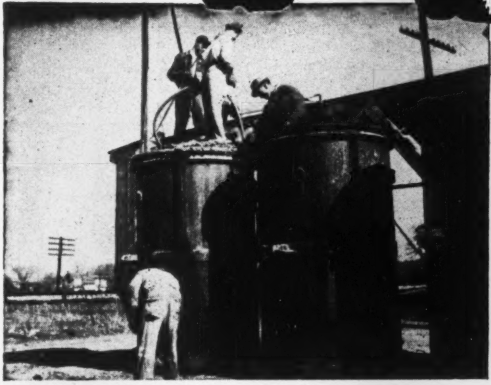
Just about finished with Canterbury, they started their biggest—the $10-million Stratford Manor project on Duck Creek Road calling for 910 apartment units.

Now that Stratford is well under way, the builders have started again—this time in Dayton, Ohio. About $8 million will be involved.

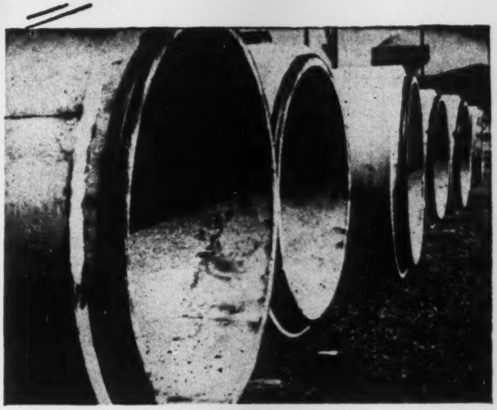
Rents for the Stratford apartments are $75 and $80, well below average rentals for two-bedroom apartments.

"Of course profit is a motive", says Warner, "but only this much: We consider money a tool to carry on our operations, like a bulldozer. The big dividend is to walk through a street that wasn't there six months ago and see the lights and people sitting down to dinner.

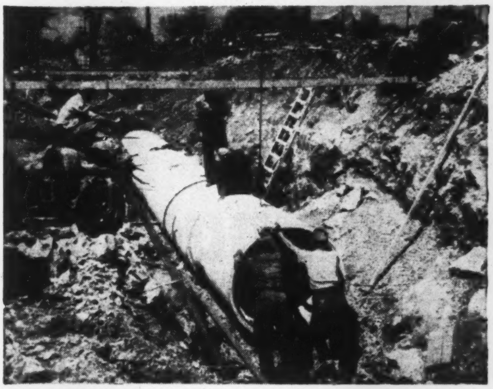




When one of Universal's 25 plants is too far away to supply you with large-diameter pipe (48 inches and up), Mobile Site-Cast Equipment can make your pipe on the site.



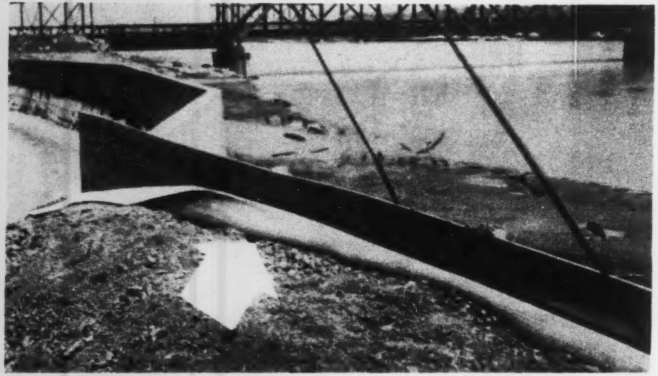
Pipe can be stockpiled within a few feet of installation ditch. (Note rubber gaskets.) It's then lifted by crane and lowered into position. So remember, Universal can . . .



. . . supply you with pipe in all sizes, and either ship in large-diameter pipe or make it right at the site. Contact office nearest you. Locations listed at the right.

ALABAMA: Decatur, Dothan, Florence. **FLORIDA:** Miami, Ocala (Florida Concrete Pipe Co.), St. Petersburg, Tallahassee, Tampa. **GEORGIA:** Atlanta. **KENTUCKY:** Louisville (Dixie Concrete Pipe Co.). **MARYLAND:** Baltimore, (Jessups). **NEW JERSEY:** Kenvil. **NEW YORK:** Binghamton, New York City, Port Washington, Rochester, Syracuse. **OHIO:** Columbus, Zanesville. **PENNSYLVANIA:** Norristown, Pittsburgh. **TENNESSEE:** Nashville. **WEST VIRGINIA:** Clarksburg, Charleston, New Martinsville, Wheeling. **AFFILIATE**—Concrete Pipe Co. of Ohio, Cleveland, Sandusky, Youngstown, Ohio; Erie, Penn.

Universal
CONCRETE PIPE COMPANY
SITE-CAST PIPE
HOME OFFICE: 297 S. HIGH · COLUMBUS, OHIO



Waterproof paper helps check floods

Citizens of Kansas City fortunately escaped the fury of the Missouri River during recent floods and the sturdy Sisalkraft paper pictured here was part of the reason why. Wherever necessary, engineers erected flashboard fences, six feet high, on top of existing levees. Sandbags were placed on the water side and Sisalkraft paper fastened on the inner face; then earth was bulldozed behind the fences. The waterproof paper, between the flashboard fence and dirt, prevented water seepage and eventual erosion. Local lumber dealers put all their on-hand supply of the material into the emergency crews' hands. It's available from The Sizalkraft Co. 205 W. Wacker Drive, Chicago 6, Illinois.

McCoy "soups up" Caterpillar D-8's

Take a caterpillar D-8 tractor—then equip it with a torque converter and super-charged D337 engine and you will have what McCoy Company, Caterpillar's distributor for Colorado believes to be the most powerful single engine crawler type tractor in the world.

They are producing this unit in their Denver shop and say that the job involves installation of Cat D337 engine equipped with super-charger (the same type engine as used in the new DW20 and 21 rubber-tired scraper

Ferguson RUBBER TIRED ROLLER
MODEL RT 100-S
50 TON

THE Ferguson
MODEL RT 100-S
PNEUMATIC ROLLER

50 TONS Compaction

WRITE FOR DESCRIPTIVE FOLDER & PRICES

This FERGUSON sand-ballast rubber-tire roller weighs 100,000# ballasted; 19,000# empty. 1250# bearing pressure per inch of width, fully ballasted, with 18.00x24" 24-ply tires. Other size tires also available. Tongue detachable and interchangeable with arched-type tongue for use with rubber-tired tractors. Engineered and constructed for years of rugged service.

We also manufacture
SHEEPSFOOT & TAMPING ROLLERS OF ALL SIZES
RUBBER-TIRED COMPACTORS UP TO 200 TONS
MAINTENANCE ROLLERS
BLADES - BITS - RIPPERS
SUB-GRADE PLANERS
TRAILERS - BATCHERS

SHOVEL SUPPLY COMPANY, Mfrs. Office & Plant 4900 HINES BLVD Dallas, Texas Mail Addr. P.O. BOX 1369 Cable Addr. SHOCO DALLAS

P&H has done it again!

MITI-MITE
P&H
Converts easily for all attachments. As a Crane 7-ton lifting capacity.

This time P&H scooped the industry with a machine that will change your ideas about small truck cranes.

It's a tremendous innovation — 100% automotive in concept and construction. You'd hardly believe a machine that does so many things could be so simple, so compact, so easy to operate, so powerful. What backbone! Everything is designed around a rugged power box built of inch-thick steel plate — all welded to preserve perfect alignment. Like a tank transmission, you can stake your life on it!

RIDES ON ANY SUITABLE TRUCK — Mounting? New, used, or rebuilt, your P&H dealer will do it — or do it yourself . . . it's easy.

CONVERTS EASILY ON THE JOB — Whatever you require — shovel, crane, dragline, trench hoe, clamshell or magnet, you have it with simplified attachments you can change right in the field. And with any one of them, you'll have the famous P&H stability that gives you greater work capacity. Your P&H dealer has all the facts.

Write today for Bulletin TX-127

P&H TRUCK CRANE DIVISION
HARNISCHFEGER
CORPORATION
Milwaukee 46, Wisconsin

See your P&H Dealer!

WAREHOUSE STEEL USERS—

Our

Personalized

Steel Service

gives you more value for your dollar

Check this list **of extra, money-saving benefits against what you are getting from your present warehouse steel source.**

☑ **14 warehouses** to draw on—We will conduct nation-wide search for your needs—no *extra* cost.

☑ **Technical assistance—**Our product experts will work "full-time" helping solve your material or production difficulties—no *extra* cost.

☑ **Complete** shearing, cutting and burning service —Our modern equipment enables you to get your steel cut quickly and accurately to your specifications—regular warehouse charges apply.

☑ **A "one-call" source** for all your steel needs—Carbon—Alloy—Stainless—Tubing—Aluminum —Machinery and shop supplies. We stock them all for you—no *extra* charge.

☑ **Personalized Service—***All* of our people are trained to treat you right.

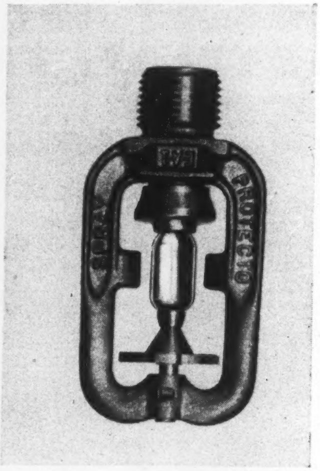
Your friendly U. S. Steel Supply salesman puts our service team to work for you. Why not let him help you?

UNITED STATES STEEL SUPPLY DIVISION
UNITED STATES STEEL COMPANY
HEADQUARTERS: 208 So. LA SALLE ST., CHICAGO 4, ILL. • WAREHOUSES COAST-TO-COAST
BALTIMORE · BOSTON · CHICAGO · CLEVELAND · LOS ANGELES · MILWAUKEE · MOLINE, ILL. · NEWARK
PITTSBURGH · PORTLAND, ORE. · ST. LOUIS · TWIN CITY (ST. PAUL) · SAN FRANCISCO · SEATTLE
Sales Offices: INDIANAPOLIS · KANSAS CITY, MO. · PHILADELPHIA · PHOENIX
ROCKFORD, ILL. · SALT LAKE CITY · SOUTH BEND · TOLEDO · TULSA · YOUNGSTOWN

UNITED STATES STEEL

units recently marketed by Caterpillar) that develops its maximum horsepower at 2000 rpm but is reduced to 1800 rpm in this installation.

Combination of standard transmission and torque converter gives greater range of power output and greatly increases the efficiency of the torque converter unit. Approximate weight of the tractor is 46,000 pounds and the McCoy men say it furnishes ample power and traction for loading the largest scrapers with minimum time and effort. McCoy Company, 60th and Colorado Boulevard, Denver, Colorado.



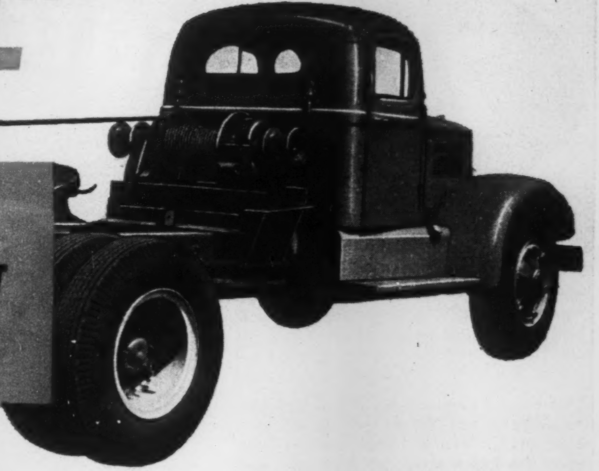
New Protecto-Spray nozzle dilutes ingredients of flame

Years of research in the Grinnell Fire Control Research Laboratories have culminated in the development of a new nozzle that fights fires at the molecular level by diluting the active ingredients of flame.

Studies of the nature of flame showed that it results from high velocity collisions between molecules of oxygen (which make up 21 per cent of air) and molecules of hydrocarbon in gases distilled from burning material. The new vaporizing nozzle simply dilutes both the oxygen and hydrocarbons with water vapor until the mixture is too lean to burn. When heated oxygen collides with heated hydrocarbon molecules, more heat is released. By interposing inert water vapor molecules between oxygen and hydrocarbons, collisions are prevented and the flame is extinguished, according to the manufacturer.

(*Continued on page* 282)

"PULL"



THAT PULLS DOWN EQUIPMENT MOVING COSTS

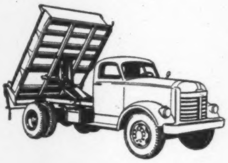
GarWood TRUCK WINCHES

They're tougher . . . last longer . . . pull more . . . safer to operate . . . require less maintenance. Gar Wood Winches have the "pull" not only to get more work done, but also to pull down costs. Their definite superiority has made them the preferred winches in all fields where truck winches are used.

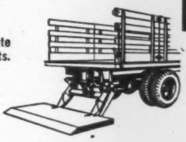
Drum shaft is oversize, made of heat-treated alloy steel. Worm gear is alloy phosphor gear bronze with amazing wear characteristics. Drum is high carbon steel casting. Worm shaft has oversize ball bearings which require no adjustment. An exclusive Gar Wood feature is the automatic safety brake. Self-energizing, it will stop and hold any load up to winch rating yet releases fully in hoisting direction, practically eliminating drag and wear.

Another Gar Wood exclusive feature is the flexible mounting which permits chassis frame to weave and twist without cramping or bending winch drum shaft or bellmouthing the bushings. Gar Wood Winches are run-in at the factory and load-tested by lifting actual weights.

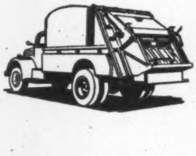
Gar Wood builds better winches . . . the kind that are always a help, never a headache. Write for Bulletin . . . use the coupon—now.



Gar Wood Dump Bodies and Hoists handle larger payloads. Bulletin HB-304.



Gar Wood Elevating End-Gate cuts pick up and delivery costs. Bulletin L-101.



Gar Wood Load-Packer compresses a bigger load of refuse—reduces collection costs. Bulletin M60.

GAR WOOD GW INDUSTRIES

GAR WOOD INDUSTRIES, INC.

Wayne Division • EXECUTIVE OFFICES, WAYNE, MICH.

TRUCK EQUIPMENT: Dump Truck Bodies & Hoists, Winches & Cranes, Refuse Collection Bodies, Elevating End-Gates. CONSTRUCTION EQUIPMENT: Excavators, Scrapers, Dozers, Ditchers, Spreaders, Finegraders, Truck-Mounted Road Graders

52-15

Gar Wood Industries, Inc.
Executive Offices, 36219 Main St., Wayne, Michigan

Please send me Bulletin WC-204 explaining why Gar Wood Winches cut costs; also the other bulletins checked below.

☐ MS1 Dump Body and D8R Hoist ☐ End-Gate Bulletin L-101
☐ Load-Packer Bulletin M60

Name____________________ Title__________

Company____________________________

Address____________________________

24 MIX SELECTIONS

with "repeater" for automatic re-batching

Fully automatic and completely flexible, this Johnson Transit-Mix Plant produces 24 different size and type batches of aggregates and cement for a commercial ready-mix company at Covington, Ky.

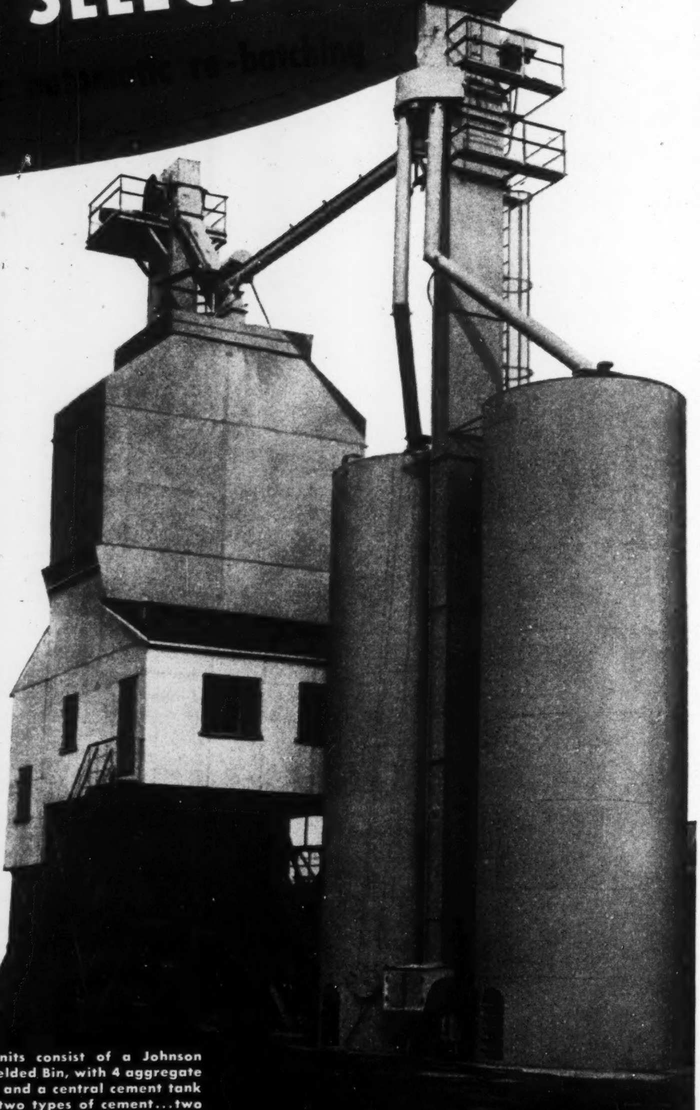
Dial on a 24-mix-selector panel provides for 2500-lb. or 3000-lb. (per sq. in.) concrete in ½, ¾ and 1-yard batches. On each size batch there are four individual selections for 3, 4, 5 or 6-inch slumps. This makes it easy to change from one type of batch to another as needed. A "repeater" provides for continued automatic batching of any one selection for a pre-determined number of times. Operator simply sets the mix selector, sets the "repeater", pushes the "start" button . . . and the plant weighs out batches fast, accurately.

Plant is equipped with a 2500-lb. sand batcher . . . three 2500-lb. aggregate batchers for fine, medium and coarse aggregates . . . a 2000-lb. water weigh batcher . . . and a 2000-lb. cement batcher with dual fill valves for selecting two types of cement. All are fully automatic, and are controlled by the Central Dial Scale Unit with pen recording of the weight of each single-material batch.

Check the increased efficiency you can get on your transit or central-mix operations with Johnson plants and accessory equipment. See your Johnson distributor, or write us.

C. S. JOHNSON COMPANY

CHAMPAIGN,
ILLINOIS
•
(Koehring Subsidiary)

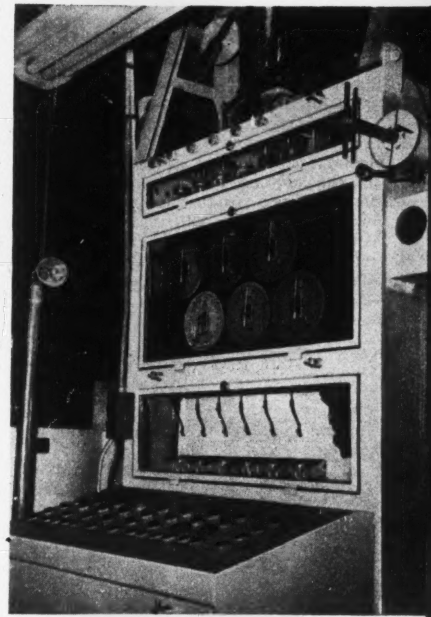


Main plant units consist of a Johnson 200-yd. All-Welded Bin, with 4 aggregate compartments and a central cement tank arranged for two types of cement...two 1032-bbl. storage silos and bucket elevator for cement. Belt conveyor and bucket elevator system feeds aggregates to bin.

JOHNSON
KOEHRING PRODUCT

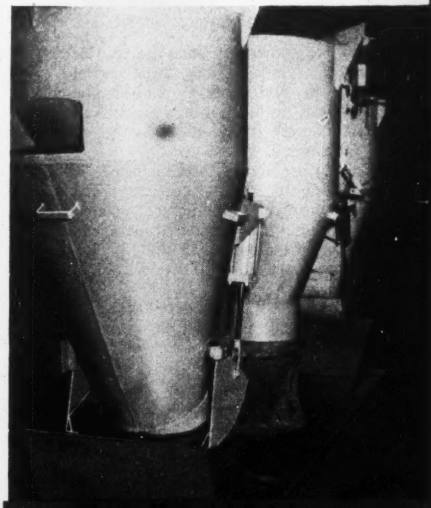
JOHNSON CONCRETE PLANTS

BINS • BATCHERS • HOPPERS • SILOS • ELEVATORS • CHARGERS • CLAMSHELL, CONCRETE BUCKETS



▲ Central Dial Scale Control Unit

on Johnson Transit-Mix Plant at Covington, Ky., is complete with time and date stamp, relays, push buttons, lights, etc., for fully-automatic operation. Graphic recorder shows "full" and "empty" weight of weigh hopper to make sure a complete batch is weighed out on each material.



Single-Material Batchers

[illegible]

With 30 digging feeds, 221 Trenchliner excavates 6½ in. to 13¾ ft. per min. It digs 16 to 36 in. wide, 8½ ft. deep, cuts within 10 in. of side obstructions. Equipped with easy-in, easy-out "Tap-In" teeth. Has full reverse of all operations . . . undercuts, makes vertical set-ins. 1-min., power-shift conveyor dumps spoil on either side. Check all Parsons wheel and ladder-type models, full crawler mounted, also rubber-tired utility Trenchliner.

PARSONS *(Koehring Subsidiary)*
Newton, Iowa

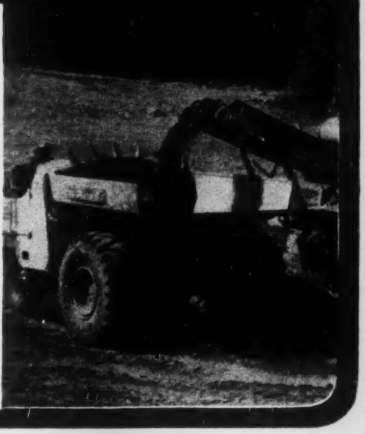
Moto-Bug has instant gravity dump with snub-line control . . . no body hoist mechanisms. This 10 cu. ft. power wheelbarrow also has full power forward and reverse . . . no push, no pull necessary to travel, back, or spot. Climbs 20% ramps fully loaded. Has interchangeable 1500-lb. flatbed, 500 or 1000-lb. fork lift, also scraper blade. Other Kwik-Mix units: 3½-S to 16-S Dandie® concrete mixers, bituminous and plaster-mortar mixers.

KWIK-MIX *(Koehring Subsidiary)*
Port Washington, Wis.

Fast-shuttling Koehring Dumptor® eliminates slow turns at loader, on narrow haul roads, and at the dumping location. With constant-mesh transmission, Dumptor travels same speeds forward and reverse . . . gets its load, drives to fill, dumps and returns to loading unit without turning. Eliminating only 2 turns saves ½ minute on every cycle. Instant gravity dump cuts another 15 to 25 seconds off haul cycles with heavy-duty Dumptors.

KOEHRING COMPANY
Milwaukee 16, Wis.

X66



The **MAJORITY** of Your
Heavy Hauling Jobs
can be handled
PROFITABLY with...
the ***POPULAR***

ROGERS Type "T"

LARGE CAPACITY IN AN 8 FT. DECK WIDTH—LEGAL IN ALL STATES. 8 TIRES ON 2 ROCKING STUB AXLES WITH LEVEL OR DROP DECK IN 15, 20, 25, 30 and 35 TON CAPACITIES

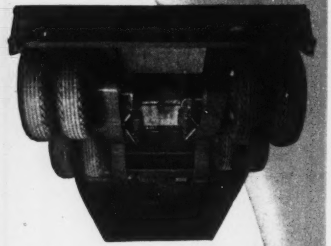
By reason of its versatile adaptability to all kinds of heavy hauling jobs, the Rogers Type "T" has steadily increased in popularity.

It's a "natural" for small and large contractors and haulers.

If you are considering the purchase of one or more trailers, by all means investigate the Type "T".

It packs powerful advantages in a multi-purpose single unit.

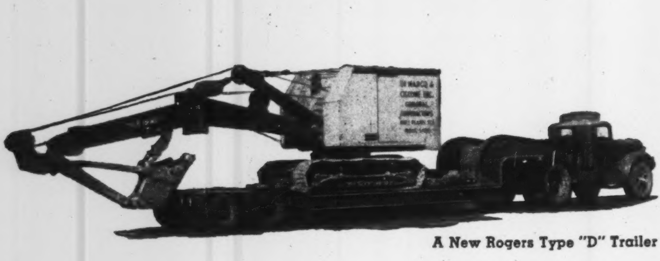
Write for full details and catalog.



A worms-eye view of the sturdy rear end and frame construction of the famous "T".

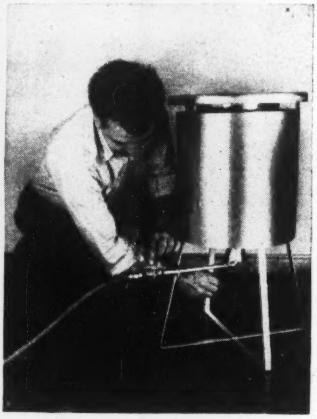
The rear end design of the Type "T" has proved so efficient it has been adopted as standard construction in Rogers Power-Lift Detachable Gooseneck Trailers.

EXPERIENCE builds 'em
PERFORMANCE sells 'em
ROGERS BROS. CORP.
ALBION, PENNA.



A New Rogers Type "D" Trailer

Heat from a fire raises the temperature of nearby flammable material to its distillation and ignition point. The automatic Protecto-Spray diverts this heat to vaporize water droplets. Removal of heat checks spread of fire and the resulting water vapor dilutes the flame gases so that they cannot burn. Approved by both the Factory Mutual Laboratories and the Underwriters Laboratories, the Protecto-Spray nozzles are available from Grinnell Company Inc., Providence, Rhode Island.



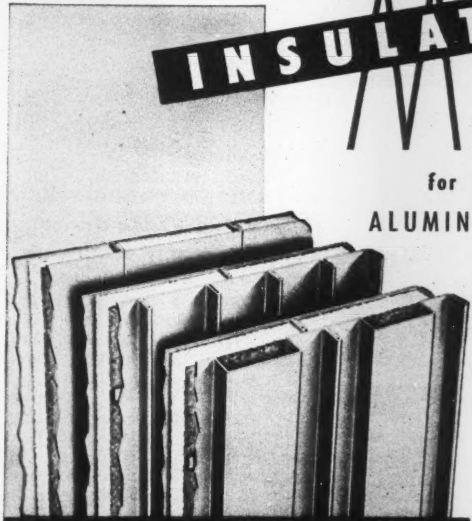
Portable space heater burns propane

A new portable space heater for temporary heating has been introduced in two models. Called the Sonic-Ray, it burns propane gas and a 100-lb tank is said to last from 40 to 60 hours at a cost averaging 11 to 17 cents per hour. Recommended for drying plaster, mortar, concrete etc. or for furnishing temporary heat in warehouses, garages, freight cars and the like, it's rated at 85,000 to 150,000 btu's per hour. Total weight is only 31 lb.

The Sonic-Ray Model D shown here comes equipped with a regulator, 7-ft hose and manual control for operation. The Model F is constructed in the same way but includes a valve control, thermocouple and pilot light for continuous, unattended operation.

The heaters are 20 in. square at the base, 31 in. high and 17 in. in diameter at the top. The tank can be set indoors or outdoors and the heat furnished is said to be exceptionally dry, leaving no condensate or sweating on walls. Bica Company, 1170 N. State St., Girard, Ohio.

(*"New Products" on page 284*)



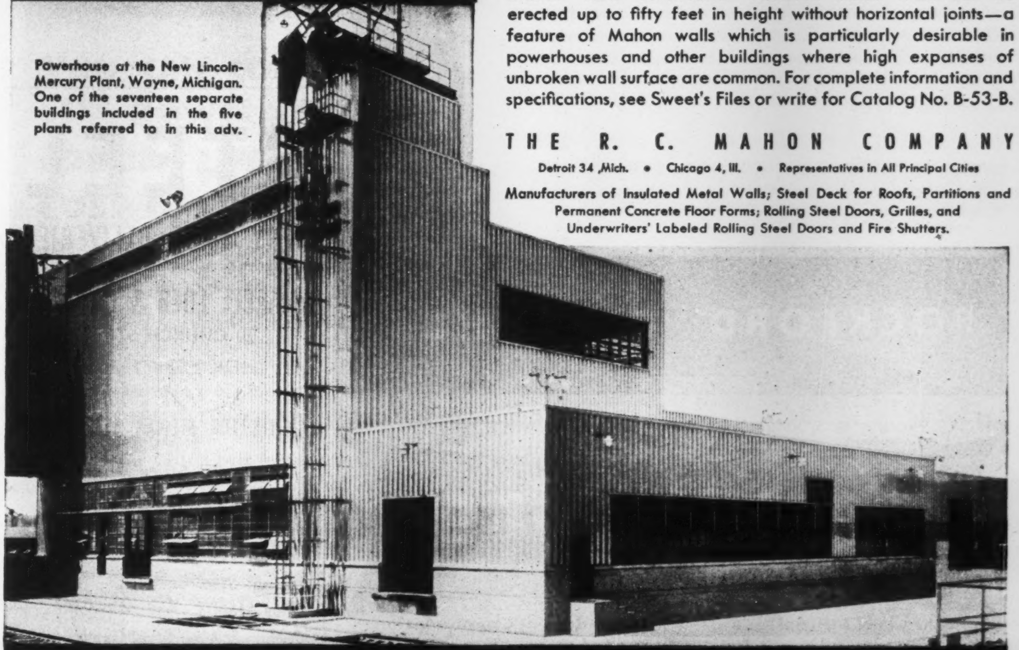
INSULATED METAL WALLS

for INDUSTRIAL and COMMERCIAL BUILDINGS

ALUMINUM, STAINLESS or GALVANIZED STEEL

As evidence of the trend to Insulated Metal Walls in modern construction, the following statements are presented: 520,000 sq. ft. of Mahon Insulated Metal Walls with aluminum exterior plates were employed in the construction of three complete new industrial plants built by one manufacturer in three widely separated localities. More than 66,000 sq. ft. of the same type of wall was employed in the construction of two complete new plants for another manufacturer. In the five new plants referred to, there were seventeen separate buildings of various industrial types. The fact that additional plants were subsequently built by both of these manufacturers, employing the same identical wall construction in each case, indicates the degree of enthusiasm among architects and owners for the striking appearance of the finished buildings, as well as the time and labor-saving advantages of this type of permanent, firesafe construction. Mahon "Field Constructed" Insulated Metal Walls can be erected up to fifty feet in height without horizontal joints—a feature of Mahon walls which is particularly desirable in powerhouses and other buildings where high expanses of unbroken wall surface are common. For complete information and specifications, see Sweet's Files or write for Catalog No. B-53-B.

FLUSH, RIBBED, or FLUTED
Over-all "U" Factor of Various Types is Equivalent to or Better than Conventional 16" Masonry Wall



Powerhouse at the New Lincoln-Mercury Plant, Wayne, Michigan. One of the seventeen separate buildings included in the five plants referred to in this adv.

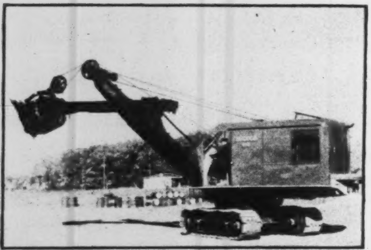
THE R. C. MAHON COMPANY

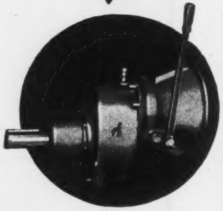
Detroit 34, Mich. • Chicago 4, Ill. • Representatives in All Principal Cities

Manufacturers of Insulated Metal Walls; Steel Deck for Roofs, Partitions and Permanent Concrete Floor Forms; Rolling Steel Doors, Grilles, and Underwriters' Labeled Rolling Steel Doors and Fire Shutters.

MAHON

Retract–Dig–Hoist–Crowd–Dump





—All With Finger-Tip Control

The OSGOOD Excavator combines finger-tip control with balance, power, speed, precision and rugged construction. ROCKFORD Speed Reducers bring engine RPM within the operating cycle of the excavator. Let ROCKFORD clutch engineers help specify a practical power transmission control that will enable *your* machine to operate more efficiently and economically.

BW

B-W ENGINEERING MAKES IT WORK
B-W PRODUCTION MAKES IT AVAILABLE

ROCKFORD
CLUTCHES
POWER TAKE-OFFS

ENGINEERING BULLETIN SENT ON REQUEST

ROCKFORD CLUTCH DIVISION BORG-WARNER
313 Catherine Street, Rockford, Illinois, U.S.A.

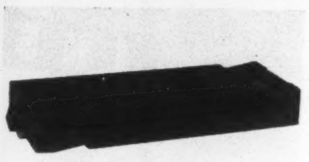
ROCKFORD CLUTCHES

Core Drilling
by Contract

Exploration for coal and other mineral deposits. Foundation test boring and grout hole drilling for bridges, dams and all heavy structures. *Core Drill Contractors for more than 60 years.*

JOY MANUFACTURING CO.
Contract Core Drill Division • MICHIGAN CITY INDIANA

NEW PRODUCTS



Adjustable wedge device can level heavy machinery

A leveling device is available—in two different sizes—for adjusting and leveling heavy machinery and bases. Called LEV-LERS, they are manufactured in 6- and 8-in. sizes. Total height adjustments are $\frac{3}{8}$ and $\frac{1}{2}$ in.; lifting capacities, 3 and 5 tons respectively; and actual weight, 5 and 10 lb respectively. Square or hex head bolts are optional and the wedges may be grouted after leveling is completed or left free for periodical adjustment. They are self-locking under load. The Filter & Injector Co., 1001 So. Broadway Ave., Springfield, Missouri.

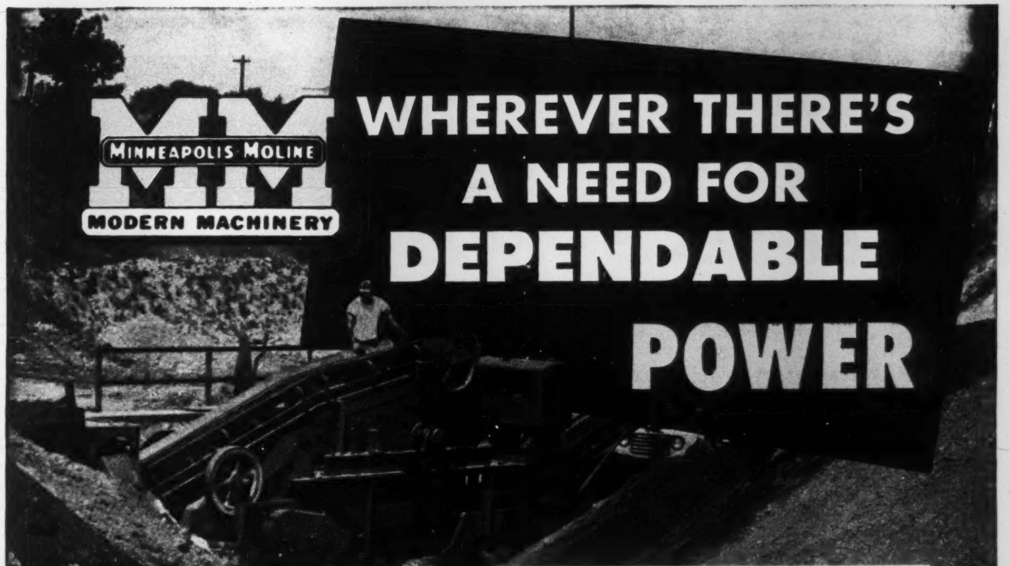
(*Continued on page 286*)

STEEL
VERY FAST DELIVERIES

MARCEL LOEB & CO. INC.
30 CHURCH STREET
NEW YORK 7, N. Y.

AGENTS FOR BELGIAN STEEL MILLS

Steel Bars & Strips
Structural Steel Shapes
Reinforcing Bars
Bar Size Angles
Special Steel Sections
Alloy Steel
Carbon & Alloy Steel Castings
Cold Finished Bars
Bolts & Nuts
Wire Products


MM
MINNEAPOLIS MOLINE
MODERN MACHINERY

WHEREVER THERE'S A NEED FOR DEPENDABLE POWER

YOU CAN COUNT ON POWER UNITS for *LONGER LIFE...LOWER COST OPERATION*

Heavy-duty design is relative in terms of the job an engine has to perform.

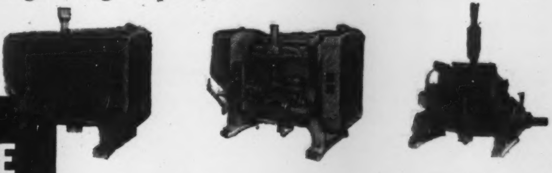
MM engines develop their torque and power at moderate speeds to handle continuous or sudden loads without strain. These are the qualifications necessary for heavy-duty industrial use that are not available in light engines that obtain their torque at high speed. Compare MM heavy-duty design part for part, and pound for pound with others. Determine which engine is built for longer, more dependable operation. Consider what MM large bearing areas, large crank shaft diameters, and thick cylinder wall construction means in terms of that extra margin of durability.

See how MM cylinder blocks are made removable and of special long wearing iron alloy . . . oil pump, water pump, and governor are gear driven for extra dependability. MM also maintains strict quality control for finest precision fitting parts.

Get the MM facts on dependable trouble-free engine operation!

SEE YOUR MM DISTRIBUTOR—DEALER OR WRITE . . .

MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINN.



MM POWER UNITS ARE AVAILABLE TO FIT ALL YOUR REQUIREMENTS

How Tuffy® Can Help You

CUT COSTS 3 WAYS

—on Dozing, Scraping & Dragline Operations

① ELIMINATES UP TO 75% OF DOZER ROPE WASTE!

Tuffy DOZER ROPE

Stop wasting 40 or 50 feet of good rope whenever 10 feet or so become crushed or cut on the drum. Mount a reel of Tuffy Dozer Rope just back of the wedge socket . . . feed just enough new rope through the socket to *replace only the damaged part.* ½" rope available in 150′ reels.

② "33⅓% MORE SERVICE" reported by users of

Tuffy SCRAPER ROPE

Save on replacements! Tuffy's ability to handle extra yardage means more days of service, lower material handling costs. Test Tuffy on your equipment. When you order, simply give length, diameter and the name "Tuffy!"

③ "...200,000 Yds. Expected—But went 432,371 Yds.!" reported by a user of

Tuffy DRAGLINES

Proved ability to give longer service life with fewer delays on the job. Use Tuffy for digging, casting or loading—handling *any* material. See how its extra flexibility and stamina help you cut costs. Easy to order: just give length, diameter and "Tuffy!"

Send for Complete Information today

union Wire Rope corporation

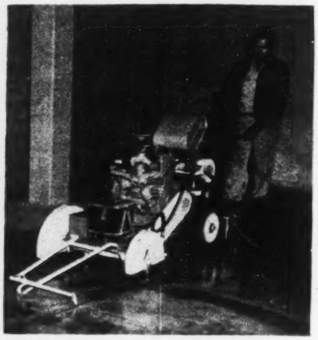
Send Information on Tuffy:
☐ DOZER ROPE
☐ SCRAPER ROPE
☐ DRAGLINES
☐ SLINGS

2228 Manchester Ave. Kansas City 3, Mo.

Firm Name ____________________

Address ____________________

City ____________ State ____ Zone ____



New concrete cutter is self-propelled by motor

By removing the human variations that occur in feeding a cutting wheel into material and putting them under the control of a stepless variable-speed reducer, the Felker Di-Met Model 252 concrete cutter can save up to 50 per cent in the life of diamond wheels. A 13½-hp Wisconsin engine not only drives the blades but furnishes power to the rear wheels through the speed reducer and friction drive. Speed may be adjusted from a fast walk to a crawl by rotating the speed adjustment crank. Double-acting hydraulic jacks raise or lower the diamond wheels. They also expedite coupling the machine to a trailer hitch for towing, the front wheels automatically retracting as the valve is released. Either end of the spindle will accommodate wheels in diameters from 10 to 18 in., and wheel guards (14 to 18 in.) are instantly interchangeable on either side. They hinge at the top center to expose the blades for curb cutting. A pressure connection is provided for tying into an external water source. FELKER MANUFACTURING CO., TORRANCE, CALIFORNIA.

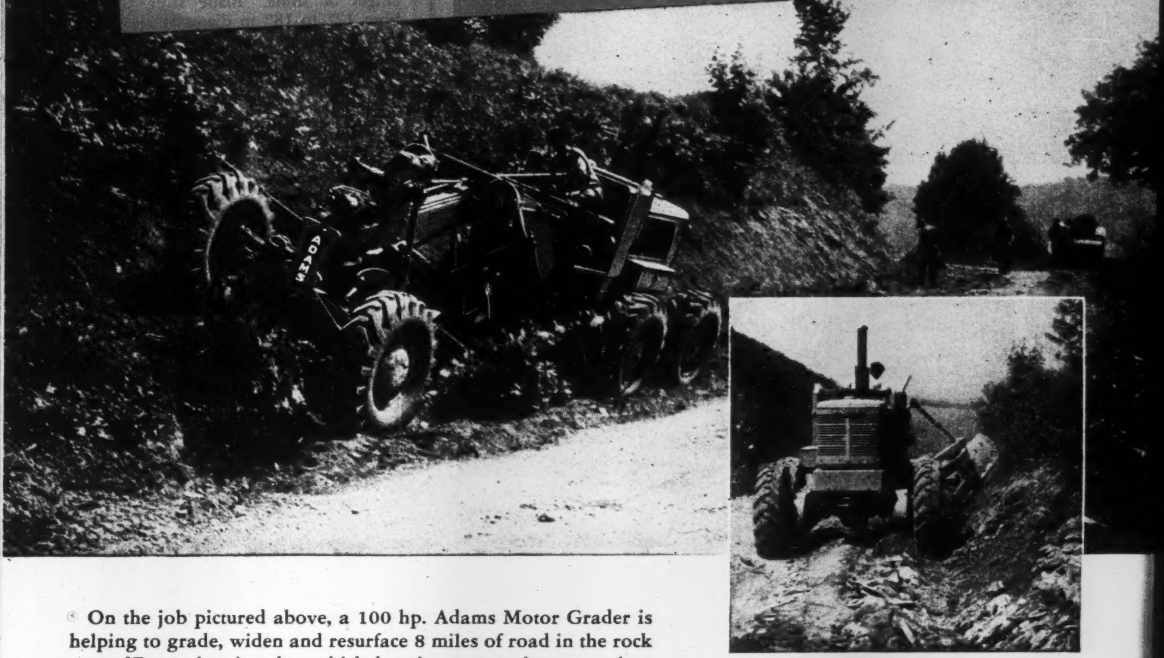
New abrasive blades reinforced with fabric

A new masonry blade, reinforced internally with layers of strong fabric, and protected by a safety web molded into its surface can handle difficult edge cuts, grooving cuts, and grinding type cuts impossible with standard type abrasive blades. The new Eveready "TUFFIE" reinforced masonry blade is said to be virtually indestructible, because of its ability to withstand twisting strains and binds. It can be used on any make masonry or hand power saw, and cutting life is

(*Continued on page 288*)

"For Rough, Tough Jobs Adams Motor Graders are Tops"

—says KEELOR CONSTRUCTION CO.



On the job pictured above, a 100 hp. Adams Motor Grader is helping to grade, widen and resurface 8 miles of road in the rock area of Pennsylvania—than which there is none rougher or tougher.

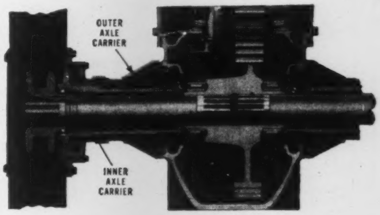
Keelor Construction Company, owner of this machine, says, "We consider Adams the best motor grader on the market, as evidenced by our recent purchase of another one of these big machines. Not only does its 100 hp. high-torque diesel engine have the lugging ability to handle roughest, toughest work, the whole machine has exceptional strength and stamina."

Performance like this is typical of all Adams Motor Graders, making them first choice of more and more contractors and highway officials. All models—from largest to smallest—offer such important advantages as *8 Overlapping Forward Speeds • High Arch Front Axle • Positive Mechanical Controls • Wide Range of Blade Adjustments* • and many others.

Ask your local Adams dealer to demonstrate how these great machines will step up operations and cut costs—*for you!*

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

ADAMS FULL-FLOATING REAR AXLE



In all Adams Motor Graders rear-end weight is borne entirely by heavy inner and outer axle carriers. The axle serves only to drive the machine—is not subject to the shocks and stresses that cause most axle failures in other graders.

Make *your* next motor grader an ADAMS

MORE AND MORE
OF THE WORLD'S WORK
DEPENDS ON
CONTINENTAL
POWER

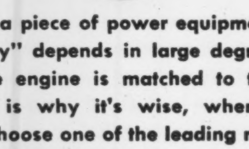
RED SEAL
CONTINENTAL MOTORS
Powerful as the Nation
AMERICA'S STANDARD

Whether or not a piece of power equipment turns out to be a "good buy" depends in large degree on the skill with which the engine is matched to the rest of the machine. That is why it's wise, when buying such equipment, to choose one of the leading makes—a make with Red Seal power. In that way, you get an engine which is not only tailored to its job, but backed by specialized experience dating from 1902.

PARTS AND SERVICE EVERYWHERE

Six series of air-cooled four-cycle engines—vertical and horizontal shaft—from 1 to 2½ h.p., for use in lawnmowers, sprayers, garden tractors, compressors, pump units, blowers, materials handlers, conveyors, and many other uses. For information, address Air-Cooled Engine Division, 12800 Kercheval Avenue, Detroit 14, Mich.

MODEL
AA-7B



Continental Motors Corporation
MUSKEGON, MICHIGAN

said to be two to three times longer than that of the standard type abrasive blade on the softer ranges of material. The TUFFIE is specially suited to the cutting of concrete block, cinder block, most common brick and the softer ranges of stone. Blade sizes range from 12″ to 18″ in diameter for masonry saws and 6″ to 8″ in diameter for hand power saws. Because of its extreme toughness, it is not recommended for cutting the very hard vitreous materials such as glazed tile, acid-proof brick, terra cotta, etc. The company recommends that these materials are best cut with the Eveready wet or dry abrasive blades or diamond blades. EVEREADY BRIKSAW COMPANY, 1509 SOUTH MICHIGAN BOULEVARD, DEPARTMENT 230, CHICAGO 5, ILLINOIS

New product brief

Sealed ball bearings, exclusively designed to keep dirt out—and lubricant in—and that are interchangeable with conventional non-sealed bearings, have been annnounced by **SKF Industries, Inc., PO Box 6731, Philadelphia 2, Pa.** The seal is made of duPont Fairprene, and is said not to be affected by petroleum-base lubricants, normal operating temperatures or aging.

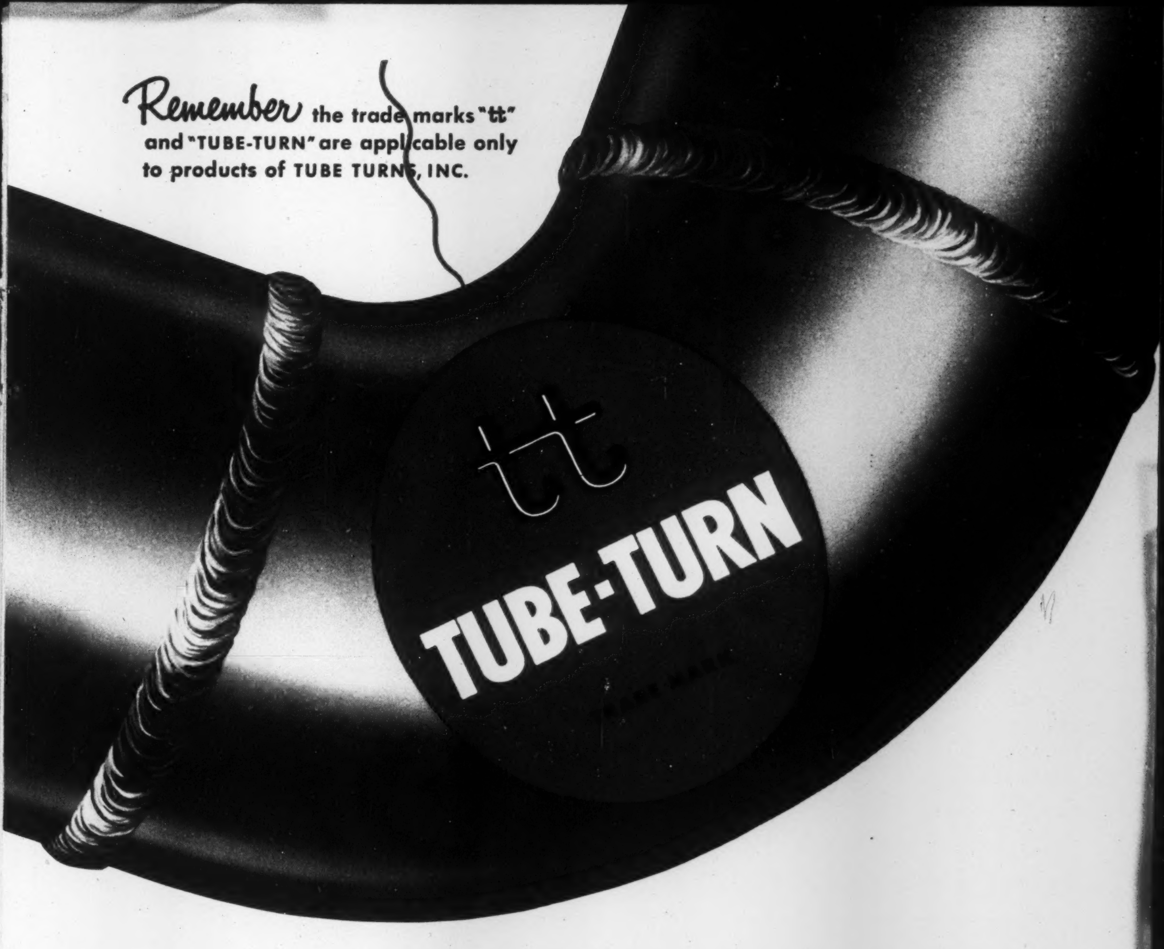
A new **K&E steel measuring tape** called "Boss Wyteface" is available from **Keuffel & Esser Co., Hoboken, New Jersey.** With a wide, reel-like winding handle and notched finger grips, it's a convenient tool for working in all weather conditions.

A new **all-purpose electric insulating varnish,** GE 9700, has been developed by the **Chemical Division of General Electric Co., Pittsfield, Mass.** It's suitable for treating motor and generator cores and windings, magnet coils and transformer windings; can be used on rotors with speeds up to 10,000 rpm; may be applied by dipping, roller coating, brushing, spraying or by vacuum or pressure impregnation.

Fuel savings of diesels over gasoline engines can be easily calculated in dollars on a **cost comparator** prepared by **Cummins Engine Co. Inc., Columbus, Indiana.** The handy, slide rule-type calculator allows power users to quickly determine early savings that can be realized through the use of their Cummins Diesels. The comparator is based on fuel savings experienced by operators during the 33 years that their engines have been used on heavy-duty jobs.

(*Continued on page 291*)

Remember the trade marks "tt" and "TUBE-TURN" are applicable only to products of TUBE TURNS, INC.



Engineered to save maintenance manhours

Scrappy says, "Aid defense—more scrap today... more steel tomorrow."

Write Dept. E-9 for free booklet giving Dimensional Data on types, sizes and materials of TUBE-TURN Welding Fittings and Flanges.

THIS TUBE-TURN WELDING ELBOW is engineered for shape, size, dimension, and wall thickness . . . to provide you with permanent, leakproof piping. It is forged by the only process that produces a wall as uniform in thickness and true in circularity as the original seamless pipe . . . guaranteeing accurate fit-up and *full strength throughout.*

More than ever, any piping installation you make should be maintenance-free, and have extra long life . . . that's why it pays to *specify* TUBE-TURN Welding Fittings and Flanges. For good service call on your nearby TUBE TURNS' Distributor . . . you'll find one in every principal city.

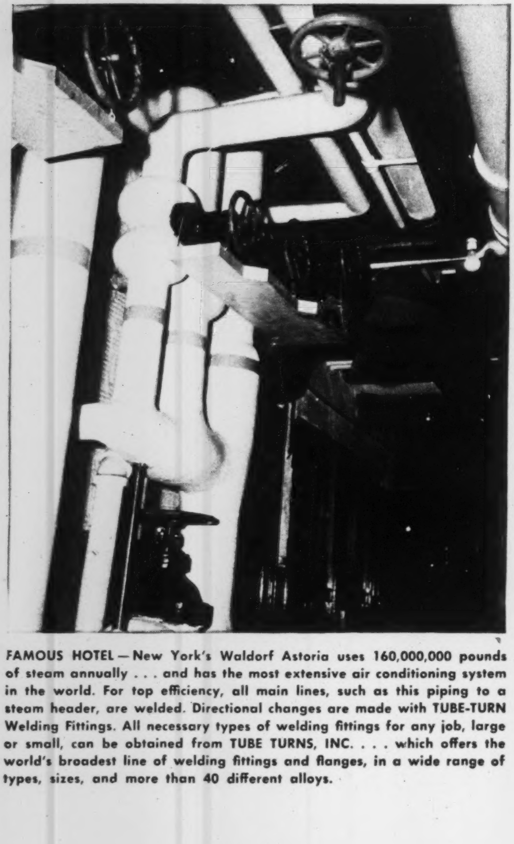
Be sure you see the double "tt"

TUBE TURNS, INC. LOUISVILLE 1, KENTUCKY

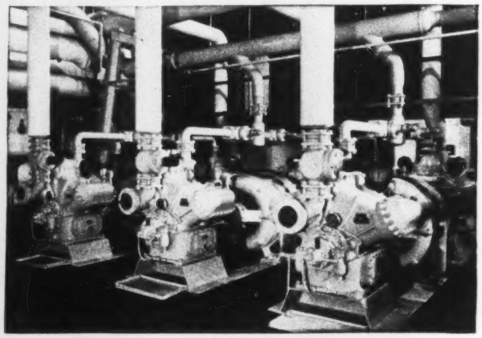
DISTRICT OFFICES: New York · Philadelphia · Pittsburgh · Chicago · Houston · Tulsa · San Francisco · Los Angeles
TUBE TURNS OF CANADA LIMITED, CHATHAM, ONTARIO... A wholly owned subsidiary of TUBE TURNS, INC.

[illegible]

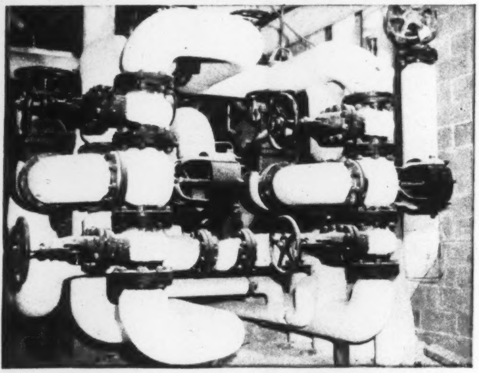
Large buildings cut maintenance with welded piping ...using TUBE-TURN Welding Fittings



FAMOUS HOTEL—New York's Waldorf Astoria uses 160,000,000 pounds of steam annually . . . and has the most extensive air conditioning system in the world. For top efficiency, all main lines, such as this piping to a steam header, are welded. Directional changes are made with TUBE-TURN Welding Fittings. All necessary types of welding fittings for any job, large or small, can be obtained from TUBE TURNS, INC. . . . which offers the world's broadest line of welding fittings and flanges, in a wide range of types, sizes, and more than 40 different alloys.



DEPARTMENT STORE—Long known for progressiveness in the retail field, the Lazarus Company was one of the first to air condition its selling areas. Facilities have since been extended to all 32 acres of floor space. To keep maintenance to a minimum, an all-welded piping system, using reliable TUBE-TURN Welding Fittings and Flanges, was specified for refrigeration equipment, condensers, pumps, etc. Thus joints are permanently leakproof, and insulation is on for life.



HOSPITAL—All piping from 2" up, for new addition to Mount Carmel Hospital in Columbus, Ohio, is welded, with TUBE-TURN Welding Fittings specified throughout. In this maze of steam piping to a hot water converter, welded piping fits neatly into a small space. With no flanges to work around, insulation was applied easily. This leakproof piping system eliminates the danger of interruption of vital services.

[illegible]

Tube Turns, Inc. has compiled a handy folder of [illegible] covering dimensions and weights of [illegible] Welding Fittings and Flanges. If [illegible]

Dimensional
Data
Weights

TUBE TURNS, INC., Dept. E-9
224 East Broadway, Louisville 1, Kentucky

Your Name ....
Position ....
Company ....
Nature of Business ....
Address ....
City .... *State* ....

DISTRICT OFFICES

New York	Houston
Philadelphia	Tulsa
Pittsburgh	San Francisco
Chicago	Los Angeles

"tt" and "TUBE-TURN" Reg. U. S. Pat. Off.

TUBE TURNS, INC.

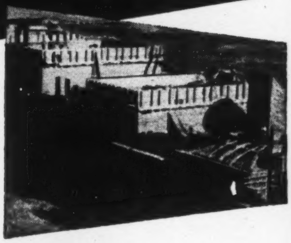
LOUISVILLE 1, KENTUCKY

NEW PRODUCTS

Scale forming in pipes, evaporators, heat exchangers, condensers, water heaters and coils that robs industry of millions of dollars in power bills can be removed, according to the manufacturer, easily and quickly with RYDLYME solvent. **Apex Engineering Co., 75 E. Wacker Drive, Chicago 1, Illinois,** demonstrates the non-corrosive, fast-dissolving qualities by having a company representative hold a particle of scale in his hand, then pour a small amount of RYDLYME on the scale. In a few moments the scale disappears in a gaseous state without injuring the demonstrator.

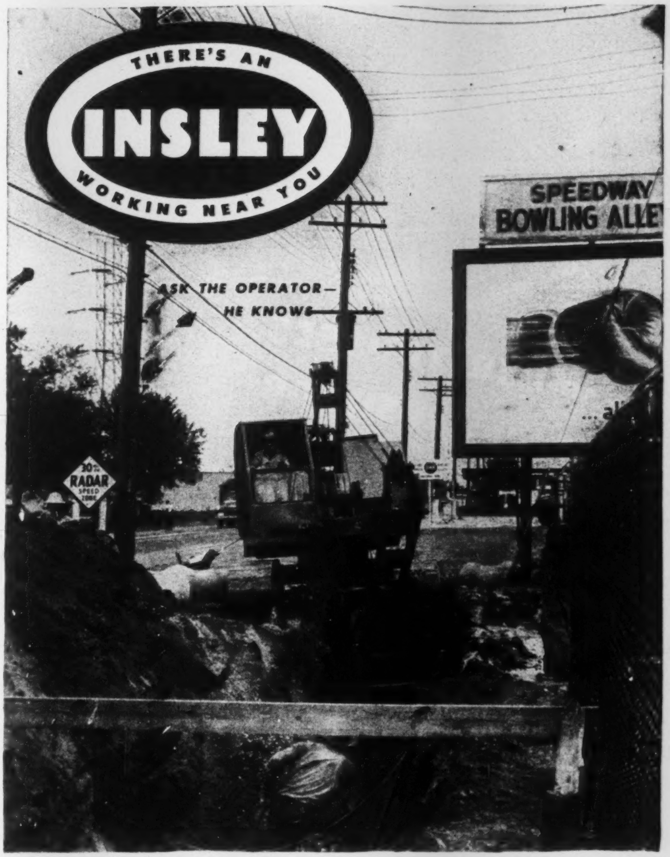
It's a comparatively easy job now to pull tractor rear wheels, pulleys flywheels and the like with the new **OTC Universal chain puller,** built to be used with the OTC 17½-ton hydraulic ram. It operates as a two-way or three-way puller and comes equipped with a 3-ft, 3,720-lb proof tested chain with a grab hook on one end. Screw-adjusted, self-centering hooks permit straight, even pulling without cocking. They're available from **Owatonna Tool Co., 380 Cedar Street, Owatonna, Minnesota.**

BONDS—
for Contractors
FAST, COUNTRY-WIDE SERVICE

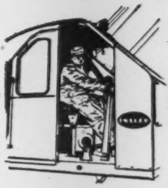


- BONDS—Bid and Performance
- Equipment Floaters
- Complete Casualty Insurance Requirements

American Surety Company
100 Broadway • New York 5, N. Y.
Agents and Brokers Everywhere



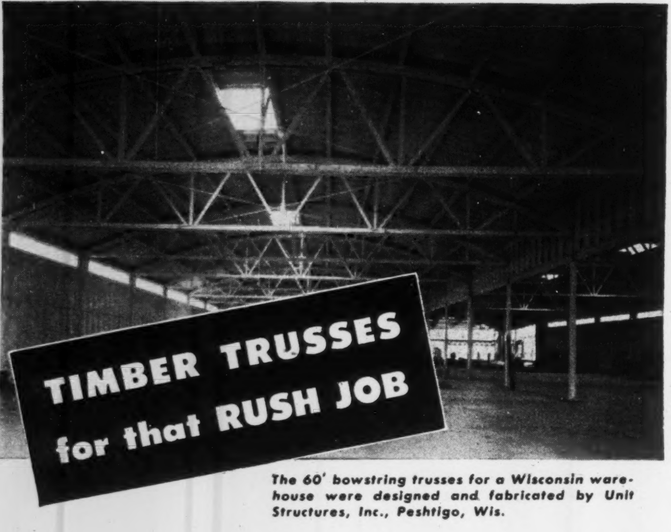
The INSLEY operator knows..



PROJECT RATED
INSLEY
BY THE USER—FOR THE USER

that Insley Equipment can be rated-for-the-project . . . he knows that specification alternates make it possible to buy the exact equipment to do his job best.

INSLEY MANUFACTURING CORPORATION • INDIANAPOLIS 6, INDIANA



The 60' bowstring trusses for a Wisconsin warehouse were designed and fabricated by Unit Structures, Inc., Peshtigo, Wis.

Now in these emergency times timber construction is going ahead on early delivery schedules.

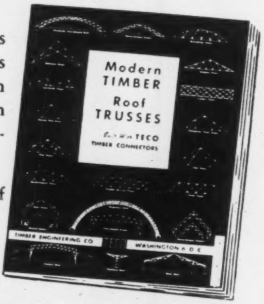
The widespread recognition of timber as an engineering material has given the building industry a new tool in this easily worked, versatile material.

Hangars and garages are being built with timber. So are warehouses, factories and other large structures. Heavy timber construction buildings, equipped completely with approved sprinkler protection, have shown a remarkable record of fire safety over many years.

The building profession now knows that, pound for pound, timber does as much work as other materials, and in its proper fields of use performs an equally satisfactory service, and generally at lower cost.

· Timber fabricators in all sections of the country are ready to help you.

Specify timber — there's plenty of it and ready as usual for early delivery.



TIMBER ENGINEERING COMPANY, 1319 - 18th St., N.W., Washington 6, D. C.

Please send FREE copy of Lank-Teco Truss bulletin and "Modern Timber Roof Trusses."

We plan to build a____________________

NAME____________________

COMPANY____________________

STREET__________ CITY__________ STATE__________

ENR

PUBLICATIONS

Diamond Bits—Sprague & Henwood diamond drilling bits are available with any one of four types of matrix; each type separately identified by the trade names TRUCAST, TRUCAST H, TUFSET and ROSSET. The company has had over 60 years of experience in manufacturing drilling equipment and this latest 16-p two-color booklet explains different grades of diamonds and their wide range of sizes to suit a variety of jobs. In addition there are sections on non-coring bits, complete drilling rigs and accessory equipment. Ask for Bulletin No. 320 from Sprague & Henwood Inc., Scranton, Penna.

Overhead Materials-Handling Equipment—A revised edition of Booklet 2008-H titled "Cleveland Tramrail Engineering and Application Data," is designed to give anyone a good conception of what tramrail overhead materials-handling equipment consists of and how it can be applied to bring definite advantages, one of which is the drastic lowering of manufacturing costs. Of special interest is new material covering track

(*Cont'd on page 295*)

ELEVATED TANKS

• For almost a century, COLE elevated tanks have provided a dependable water supply for industries and communities. COLE Quality is assured by careful, experienced designing, and watchful supervision from blueprint to finished tanks.

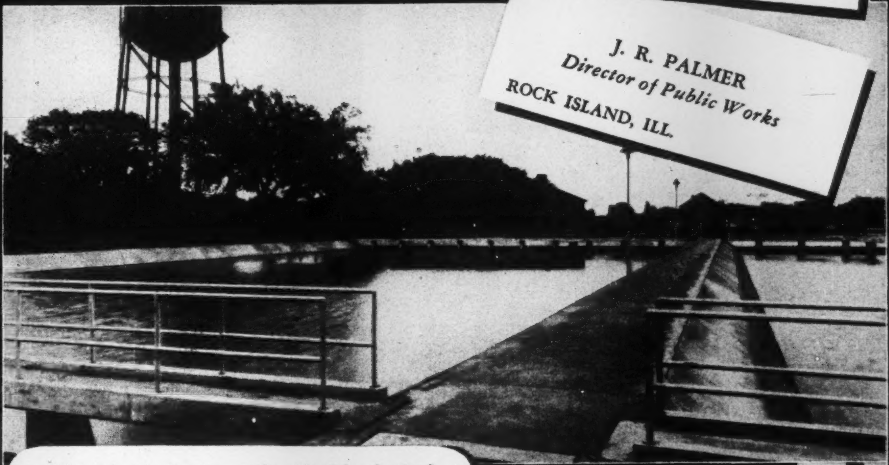
Send us your inquiries for tanks from 5,000 to 2,000,000 gallons . . . stating capacity, height to bottom, and location. Write for latest COLE catalog—"Tank Talk."

R. D.
COLE MFG. CO.
NEWNAN, GA., Established 1854
TANKS • TOWERS • VESSELS
CYLINDERS

ROCK ISLAND, ILL.
Filter Plant
(ADDITIONS COMPLETED IN 1950)

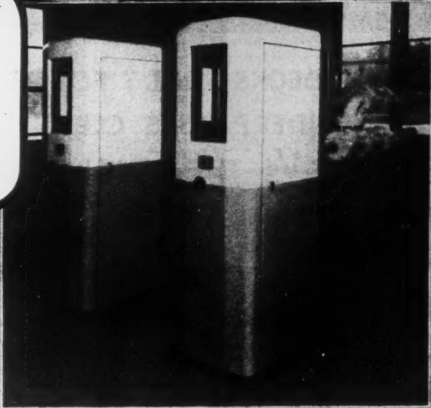
GREELEY & HANSEN
Engineers
CHICAGO, ILL.

J. R. PALMER
Director of Public Works
ROCK ISLAND, ILL.



B-I-F Industries Equipment furnished for the Rock Island Filter Plant:

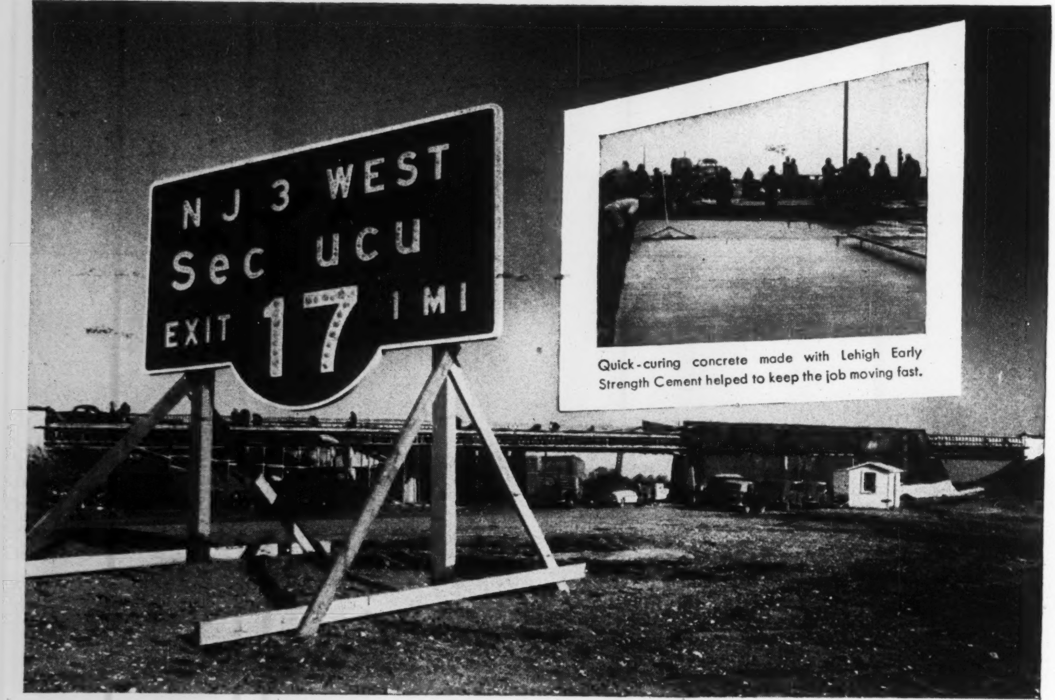
- **Builders Model CVS-M Chlorinizer, 1000# per 24 hour Capacity**
- **Builders Model CVS-M Chlorinizer, 600# per 24 hour Capacity**
- **Builders Model VEO Vaporizer**
- **Omega Loss-In-Weight Gravimetric Feeders with dissolving chambers, extension hoppers and filling canopies for feeding alum, lime and carbon.**



There comes a time in the life of any water works when a thorough overhaul of facilities is in order. This occurred recently at the Rock Island Filter Plant and has now been remedied by a major modernization program. The work included construction of a new chemical building and new mixing and reaction basins, the repair and rehabilitation of sedimentation basins, and the rehabilitation of ten existing rapid sand filters . . . all carried to successful completion by the general contractors, T. S. Willis Co. of Janesville, Wisc.

Of great assistance to the Plant Superintendent, N. J. Hoeltzner, in the operation of the plant are the BUILDERS CHLORINIZERS (illustrated at right), installed by Consolidated Plumbing & Heating Co., Kalamazoo, Mich. These modern chlorine gas feeders provide high accuracy of dosages plus unusual dependability, both vitally important in the modern water works. For Bulletins describing Builders Water Works Equipment, address Builders-Providence, Inc. (Division of Builders Iron Foundry), Providence 1, Rhode Island.

B-I-F INDUSTRIES **BUILDERS-PROVIDENCE** BUILDERS



Quick-curing concrete made with Lehigh Early Strength Cement helped to keep the job moving fast.

Bridge over New Jersey Turnpike—one of four bridges on the Interchange between the Turnpike and Lincoln Tunnel.

BRIDGE DECKS READY FOR TRAFFIC, UNDERPASSES CLEARED IN 1/3 THE USUAL TIME

The Port of New York Authority wanted the Interchange between the New Jersey Turnpike and the Lincoln Tunnel ready for early public use and the work done with the least traffic interference on the highways it crosses.

They accomplished this with Lehigh Early Strength Cement. Bridge decks were ready for traffic and highways cleared of shoring in ⅓ the usual time. The Turnpike opened on its scheduled date.

What's more, important economies resulted. Form costs were cut by ½. Winter curing costs were greatly reduced; the savings on this alone amounted to considerably more than the extra cost of Lehigh Early Strength Cement.

This is typical of how Lehigh Early Strength Cement can help you save time, cut costs and meet highest quality standards.

LEHIGH PORTLAND CEMENT COMPANY

ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.

Work proceeded as scheduled, regardless of winter weather, on bridge over Route S-3.

Built by: **THE PORT OF NEW YORK AUTHORITY**
Contractor: **POIRIER & McLANE CORP.** New York City
Ready Mixed Concrete: **HUDSON BUILDERS MATERIAL CO.,** Jersey City, N.J.

Lehigh
CEMENTS

LEHIGH PORTLAND CEMENT • LEHIGH EARLY STRENGTH CEMENT • LEHIGH AIR-ENTRAINING CEMENTS • LEHIGH MORTAR CEMENT

design, track stresses and the solution to track peening. All of the more important features of overhead tramrail equipment are described, including the flexible method of track support, carrier designs, motorhead construction, track switches, cranes, automatic interlocks and types of electrification. Photographs and sketches are used throughout.—CLEVELAND TRAMRAIL DIV., THE CLEVELAND CRANE & ENGRG. CO., WICKLIFFE, OHIO.

Steel Utility Buildings—These units for industrial, farm and commercial uses are described and illustrated in a new 8-p booklet (Bulletin No. 1). More than three pages of illustrations show various styles and applications of the USF prefabricated structures, and steps in erection. Descriptive matter includes a section on design features, full specifications, complete details of the exclusive USF clip-and-wedge assembly, and drawings of the six standard wall panels, and information on how to plan your own building. One page is devoted to the USF Handy Hut, a small steel utility building.—UNITED STEEL FABRICATORS, INC., WOOSTER, OHIO.

UNI-BATCH
Cost Saving Equipment
Use With 6S to 16S Concrete Mixers—Inclusive

Charge bin with end loader having mechanical or hydraulic type bucket.

Pat. Pending

Pull unibatch behind pick up truck.

Write or phone for more details
Winslow Scale Company
Terre Haute, Indiana—P. O. Box 1198
Used In 30 Different States

GENERAL ELECTRIC

Radio helps contractor double work output!

MANY a small contractor finds he can squeeze more profit out of a working day by using G-E 2-way radio to eliminate waste motion. For example: Al Spade of Rochester, N. Y. contracts municipal paving, hauling and snow removal jobs. From their home, his foreman's wife operates the transmitter like a telephone, relaying radio messages and instructions between work crews spread miles apart.

For less than the cost of a truck, this contractor installed a complete G-E communication system that helps him double the number of jobs he can handle efficiently. Mail coupon below for details on similar savings for your operation.

"In snow removal", reports contractor Al Spade, "we do in five hours what would require eight without mobile radio."

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PAVI
CONTRACT

With a small crew, 2-way radio control permits fast switching of trucks between jobs with a minimum of waste mileage.

How Much Does *Instant Communication* Mean To Your Business?

General Electric Company, Section 2292-4
Electronics Park, Syracuse, New York
Please tell me how General Electric 2-way radio can help me.
NAME__________
TYPE OF BUSINESS__________
ADDRESS__________
CITY__________STATE__________

GENERAL ELECTRIC

General contractor and technical supervisor of Standard Dry Wall Products, Inc., plan correction of an extreme condition existing in bleacher seats at Braves Field, Boston, Massachusetts.

THOROSEAL

SCORES ANOTHER

HOME RUN

at the Braves Field

Above photograph shows THOROSEAL FOUNDATION COATING being grouted into upper, or wearing, surface of bleacher seats.

Right photograph shows soffits of concrete seats where concrete has blistered away from reinforcing rods. Rods were sandblasted and sealed with THORITE Patching Mortar and entire undersurface sealed with THOROSEAL.

General contractor, Henry Gironi, Allston, Massachusetts, an expert, with long experience in masonry maintenance, rehabilitation and surface protection, performs correction task on Braves Field, with satisfaction to all concerned. Waterproofing Products, Inc., Allston, Massachusetts, furnished the materials.

THORITE Patching Mortar was used for sealing rods and patching cracks and blisters in concrete. THOROSEAL FOUNDATION COATING was used for grouting wearing surfaces.

"HOW TO DO IT."
Get our new 20-PAGE BROCHURE, with designer's guide. Pictorially described, in detail

THORO System

Standard Dry 40th YEAR Wall Products

NEW EAGLE, PENNSYLVANIA

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—BUILDINGS

▲ **Mass., Boston**—HOUSING—B.A. 9/12—Boston Housing Auth., 230 Congress St., Proj. 200-11, 504 housing units, Franklin Field, Dorchester. $5,000,000. Plans deposit $100. John M. Gray Co., 175 High St., archt. CD 5/4/50.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Gil Wyner Co., Inc.**, 12 Newland St., Malden, Mass. LB. **$3,576,000**, est. $4,810,000. barracks, mess facilities, Naval Air Station, Spec. 31256, BRUNSWICK, ME. First Naval Dist., 495 Summer St., Boston, Mass. Bids Aug. 19. CD 7/17.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

American Bridge Co., 1414 Statler Bldg., Boston, Mass. LB. **$2,651,084**, est. $2,400,000. furnish, place, paint structural steel South End Bridge, Agawam and Springfield. Bids Aug. 19. CD 7/25.

Bay State Contr. Co., 62 Condor St., East Boston, Mass. LB. **$79,790**, est. $43,000. channel dredging restoration of beaches Parkers River, Yarmouth, MASSACHUSETTS. Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Mass. Bids Aug. 19. CD 8/11.

BUILDINGS

LOW BIDS AND CONTRACTS

A. F. Smiley Constr. Co., 115 Trenton St., Pawtucket, R. I. CA **$500,000**. Motor INN, Rte. 9, FRAMINGHAM, MASS. Clifford A. McBride, Central Falls, R. I. Bids July 15. CD 7/9.

▲† **Arthur E. Magher Co., Inc.**, 175 Christopher St., New York, N. Y. CA. **$1,276,690**. CLIMATIC CHAMBERS BLDG. for Quartermaster Research & Development Laboratory, Eng. 19-016-52-63, NATICK, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 7/9, under LB.

† **Park Constr. Co., Inc.**, 40 Court St., Boston, Mass. LB. **$631,274**. convert Bldg. No. 1 into G.M.S. and Paraplegics Veterans HOSPITAL, WEST ROXBURY, MASS. Veterans Admin., Regional Office, 1 Beacon St., Boston 8, Mass. Bids Aug. 19. CD 7/17.

Frank Rubino & Sons, Inc., 840 Wentwood Rd., New Haven, Conn., Owner Builds, **$600,000**, 50 RESIDENCES, Pine Grove Rd., BLOOMFIELD, CONN.

George L. Hickey, Inc., 13 Spring St., Stamford, Conn., CA, **$574,890**, school, South Pine Creek Area, FAIRFIELD, CONN. Town Bd. Educ., Fairfield, Conn. Bids July 29, awarded Aug. 8. CD 8/5, under LB.

New England Constr. Co., 341 State St., New Haven, Conn., LB, **$575,000**, SCHOOL and GYMNASIUM, SALISBURY, CONN. Town Bd. Educ., Salisbury, Conn. Bids Aug. 14. CD 7/17.

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

† **N. J., Trenton**—ARMORY, etc.—B.A. 9/17—U. S. Eng., 121 N. Broad St., Phila., 1, Pa., armory and motor vehicle storage bldg. $500,000. Extended date. Tectonics Assoss., Somerville, N. J., archts. CD 8/13.

N. Y., Saratoga Springs—HOUSING—B.A. About 11/16—Saratoga Springs Housing Auth., Saratoga Springs, housing Proj. NY-20-1, for 75 families. $991,250.

▲ **N. J., Passaic**—HOUSING—B.A. About 12/2—Passaic Housing Auth., City Hall, housing, Project N. J. 13-2 for 116 families, $1,448,500. CD 9/2/49.

SOON LETS CONTRACT—BUILDINGS

N. J., Trenton—CATHEDRAL—B.A. 9/3—Episcopal Diocese of N. J., W. State St. and Overlook Ave., soon lets contract cathedral superstructure, $500,000. Micklewright & Mountford, 72 Ewing St., archts.

HEAVY CONSTRUCTION

BIDS ASKED—HEAVY CONSTRUCTION

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg,

Charles Riebe, Lansford, Pa., LB **$101,772**. constr. 4,854 ft. crushed aggregate base with bit. surf. 18 ft. wide, I-beam Bridge, L. R. 40041 (3), Luzerne Co.;

B. G. Coon. Constr. Co., 278 Union St., Luzerne, Pa., LB **$484,171**, replacement 14,222 ft. existing trolley track area with rein.-con. pavement, T. R. 222, Berks Co.;

Tri County Constructors, High School Rd. and Harrison Ave., Elkins Park, Phila. 17, Pa., LB **$552,625**, const. 19,197 ft. highway of crushed aggregate base with bit. surf., double lane by w/ 24 ft. divisor, T. R. 202, Bucks Co.;

Donald B. Stabler, 635 Lucknow Lane, Harrisburg, Pa., LB **$436,520**, surf. 40,619 ft. existing road with bit. surf. 22 ft. wide, wid'n, surf. new and existing base with bit. surf. T. R. 220, Centre Co.;

Ryan Bros. Inc., Clearfield, Pa., LB **$417,851**, constr. 21,025 ft. crushed aggregate base with bit. surf., 3 rein.-con. bridges, L. R. 40031 (6), 40031 Spur E, 40034 (2), Luzerne Co. Bids Aug. 15. CD 7/31.

▲† **Tidewater Constr. Co.**, 738 Front St., Norfolk, Va., CA **$1,283,000**, replacement and enlargement fuel pier, U. S. Naval Supply Center, NOY 73594, YORKTOWN, PA. Dpt. Navy, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. (**Correction**—contractor). CD 8/12, under CA.

† **Frank H. Wilson**, 125 Coulter Ave., Ardmore, Pa., CA, **$969,695**, 6 bachelor officers QUARTERS, DOVER, DEL. U. S. Eng., 121 N. Broad St., Phila., Pa. Bids Aug. 5. CD 8/15, under LB

BUILDINGS

LOW BIDS AND CONTRACTS

Ranes Constr. Corp., 151 Montague St., Brooklyn 2, N. Y. CA. **$513,570**, PUBLIC SCHOOL, 35, Serpentine and Clove Rds., Richmond Boro. NEW YORK. Supt. School Bldgs., Design & Construction, 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids May 14. CD 5/22, under LB.

▲ **Gardiner Manor Shopping Center**, c/o Ketchum, Gina & Sharp, archts., 227 E. 44 St., New York 17, N. Y.

Concrete Pipe Machinery Co.

MODEL "T" BELL-UP "McCRACKEN" MACHINE

With 40 cu. ft. mixer and skip-loader to serve machine

FOR MAKING PLAIN AND REINFORCED CONCRETE PIPE

Range of Sizes—4" to 36"—80% of the Market

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LEADS THE WAY TO MORE PROFITABLE PIPE BUSINESS

Eight-Hour Shifts Produce:
SEWER C-14
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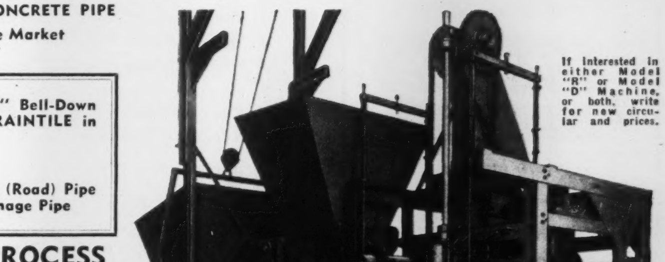
If interested in either Model "R" or Model "D" Machine, or both, write for new circular and prices.



Separate Contracts. **$2,000,000.** SHOPPING CENTER, on 30-acre tract along Sunrise Hy., BAY SHORE, N. Y. CD 8/18.

▲ **Post Homes,** c/o A. H. Salkowitz, archt., 37-60 82 St., Jackson Heights, N. Y. Owner Builds. **$3,500,000.** 150 HOUSES, 232 St. and Horace Harding Bldg., BAYSIDE, N. Y.

▲ **Radcliff Manor Homes,** c/o Matern & York, archts. 90-04 161 St., Jamaica, N. Y. Owner Builds. **$1,500,000.** 150 HOUSES on 33-acre tract, South Oyster Bay Rd., EAST NORWICH, N. Y.

▲ **Depot Constr. Corp.,** 119 W. 57 St., New York 19, N. Y. LB **$12,828,600,** general constr.;

Joseph F. Egan, 3013 Grand Concourse, New York 58, N. Y., LB **$2,168,000,** plumbing;

Dierks Heating Co., 43-32 33 St., Long Island City, N. Y., LB **$2,259,120,** heating;

Rao Elec. Equipment Co., 150 E. 41 St., New York 17, N. Y. LB **$2,143,200,** electrical work for Elmhurst General HOSPITAL (New York City Hospital), ELMHURST, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids Aug. 13. CD 7/15.

▲ **Somerset Lawns Homes,** c/o Samuel Paul, archt., 163-18 Jamaica Ave., Jamaica, N. Y. Owner Builds. **$1,500,000.** 70 HOUSES on 18 acre tract, on Clinton Rd., GARDEN CITY, N. Y.

Syndicate, c/o Alwin Cassens Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds. Est. **$600,000.** 32 HOUSES, Secor Rd., HARTSDALE MANOR, N. Y.

▲ **Hilltop Village Apartments,** c/o Samuel Paul, archt., 163-18 Jamaica Ave., Jamaica, N. Y. Owner Builds. **$10,000,000.** nine 6-story APARTMENTS, Francis Lewis Blvd. between Hillside Ave. and Grand Central Parkway, HOLLISWOOD, N. Y.

▲ **Geary Realty Corp.,** c/o Matern & York, archts., 90-04 161 St., Jamaica, N. Y. Owner Builds. Approx. **$1,500,000.** 120 HOUSES, on 40-acre tract, HUNTINGTON, N. Y.

▲ **Colonial Village Homes,** c/o Matern & York, archts., 90-04, 161 St., Jamaica, N. Y. Owner Builds. Approx. **$1,250,000.** 57 HOUSES on 25-acre tract off Northern Blvd., HUNTINGTON, N. Y.

Fox-James Co., Inc., 153 Fifth Ave., New York 10,

▲ **Quaker Hill Homes,** c/o William C. Halbert, archt., 277 North Avenue, New Rochelle, N. Y. Owner Builds. **$2,500,000.** 104 HOUSES on 33-acre tract, Weaver St., NEW ROCHELLE, N. Y.

C. W. C. Constr. Corp., 105 Court St., Brooklyn 2, N. Y. LB $517,300, const. Central Manhattan REPAIR

(Continued on page 301)

CONTRACT BONDS

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—PERFORMANCE
—PAYMENT

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The Fidelity and Casualty Company of New York

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Nationwide facilities and prompt service through 30 conveniently located branch offices, and through agents in practically every community.

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Investigate this economical, maintenance-reducing steel flooring for new or existing highway bridges, viaducts, overpasses and similar structures.

✓ Easy to handle—No Special Equipment
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Structural Plate
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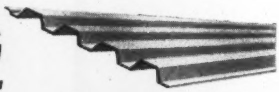

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UNITED STEEL FABRICATORS, INC.
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Hollow Metal Doors and Frames • Prefabricated Metal Buildings
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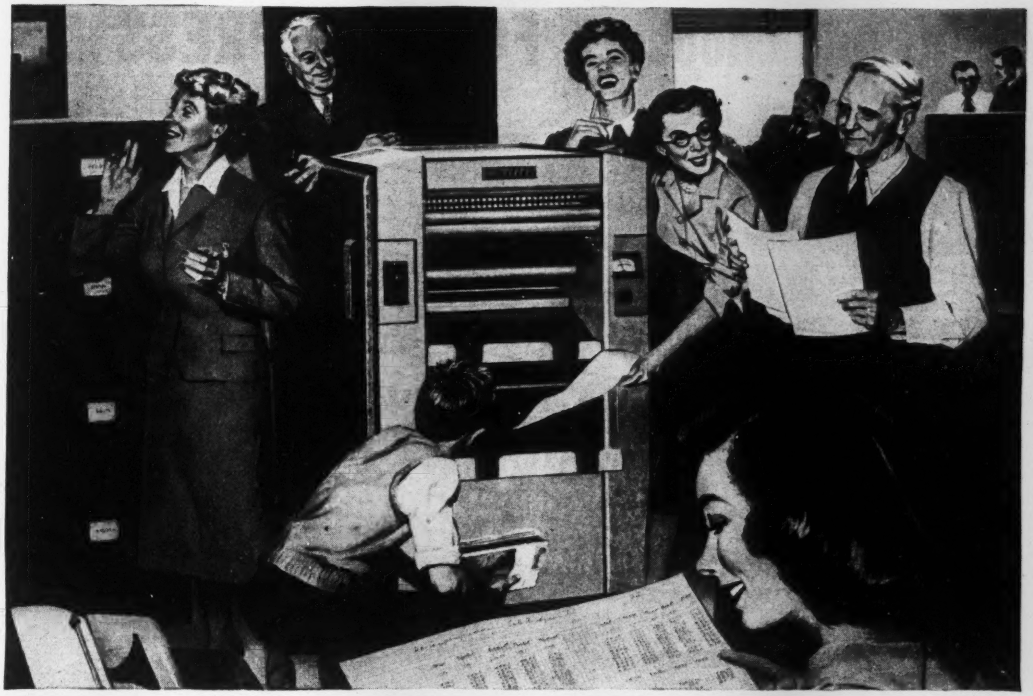

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speeds Production Control, Work Tickets, Accounting, Purchasing, Shipping, All Factory Paperwork!

Bruning announces its COPYFLEX 14—the revolutionary new management tool for increasing efficiency throughout factory and office.

Especially designed for desk-side copying of any system, accounting or office form, the "14" gives you error-proof, smudge-proof, low cost copies *in seconds.*

It is the newest of Bruning's renowned COPYFLEX machines—standard white-print equipment for engineering departments everywhere.

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*Names on request.

ONLY COPYFLEX 14—*of all desk-side copying machines—gives you . . .*

1. 20" width! Copies even *large* reports, or two ordinary forms simultaneously. Separates and returns originals automatically.

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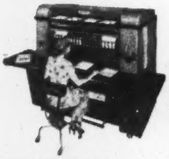
COPYFLEX 14 makes exact copies . . . delivered in seconds —flat, dry, ready-to-use. There are no masters or stencils, no inks to soil hands, no darkroom, no fumes, no special room lighting, no high-priced operators. Anyone can learn to make copies in 5 minutes.

There's a COPYFLEX machine for every price or print requirement. See how Bruning COPYFLEX can speed your paperwork, give you *better* prints *faster*. Just send in the coupon to the Charles Bruning Co., Inc., Teterboro, N. J.



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c	ACCURATE POSITIVE PRESSURE CONTROL	✓	9 Selective, positive pressure adjustment control. 10 Remote control assures greater accuracy.
d	FLEXIBILITY TO PERFORM A VARIETY OF JOBS	✓	11 Press Cylinder removable as a unit for special jacking or pulling operations. 12 Nested yoke adaptors available in various sizes for any model press. 13 Open end design provides ample clearance for long material. 14 Extra long ram travels available.
e	EASY MAINTENANCE AND SERVICING	✓	15 Separate pump and cylinder units simplify press assembly—allow quick inspection and servicing.

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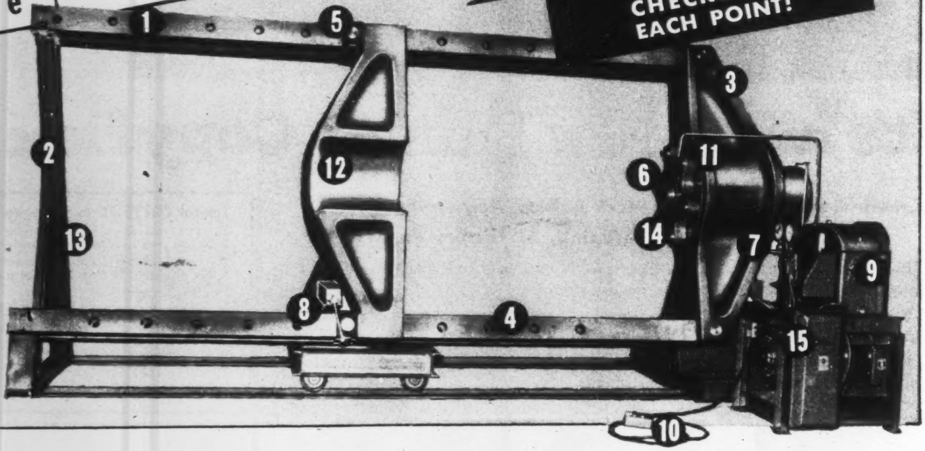

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KEEP THE WORLD MOVING

Rodgers Hydraulic, Inc.

7441 Walker St., St. Louis Park, Minneapolis 16, Minn. **HYDRAULIC POWER EQUIPMENT**

(Continued from page 298)

HEADQUARTERS for Dpt. Water Supply, Gas & Electricity, at Franklin D. Roosevelt Dr. between E. 37 and E. 38 Sts., NEW YORK, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids Aug. 13. CD 7/23.

Philip Lynne, c/o Alwin Cassens, Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds. **$500,000,** 35 HOUSES on tract, Merrick Rd. and Arlington Ave., VALLEY STREAM, N. Y.

▲ **Govern & Rosenthal**, c/o Maxfidel Blauffux, archt., 44 Court St., Brooklyn 2, N. Y. Owner Builds. Est. **$2,000,000**. 129 HOUSES, on 30 acre tract at Kings St. and Franklin St., WESTBURY, N. Y.

▲ **Gedney Meadows Homes**, c/o Stanley Wilson, archt., 10 Depot Plaza, White Plains, N. Y. Owner Builds. **$6,000,000**. 200 HOUSES on 94-acre tract on Mamaroneck Ave., WHITE PLAINS, N. Y.

Notchcroft Estates, c/o Michael D. Schwartz, archt., 51 Vesey St., New York 7, N. Y., Owner Builds, **$600,000,** 40 HOUSES on Lower Notch and Hillside Aves., LITTLE FALLS, N. J.

Blase Rowikio, Inc., Mt. Holly, N. J., Separate Contracts. **$500,000,** RESIDENTIAL DEVELOPMENT, MOUNT HOLLY, N. J. J. Raymond Knopf, 636 Penn St., Camden, N. J., archt.

Elmwood Gardens, Inc., Pottstown, Pa., Separate Contracts **$645,858,** State Subsidized HOUSING, COATESVILLE PA. S. Kendrick Lichty, 830 Lancaster Ave., Bryn Mawr, Pa., archt.

Burnly Constr. Co., Garrett Rd., Upper Darby, Pa., Separate Contracts. **$576,000.** RESIDENTIAL DEVELOPMENT, Fairmount Rd., etc. HAVERTOWN, PA. Lewis J. Cowan, 1505 Pine St., Phila., Pa. archt.

▲ **Foster Wheeler Corp.**, 165 Broadway, New York, N. Y. CA Approx. **$10,000,000.** design and construct steel crude Oil REFINERY, concrete fdns., PHILA., PA. Gulf Oil Corp., 30 and Penrose Ave., Phila., Pa. CD 5/27/48.

M & L Constr. Co., Inc., 108 S. 40 St., Phila., Pa., CA **$646,473.** Wilson Park HOUSING (fdns.), PHILA., PA. Phila. Housing Auth., 32 S. 15 St., Phila., Pa. CD 6/5, under LB.

Arnold Constr. Co., 4561 Indian Rock Terrace N.W., Wash., D. C., CA, **$539,500,** 83 unit 7 bldgs., APARTMENTS, Chesapeake St. and Barnaby Rd. and 7 St. S.E., Wash., D. C. Barnaby Corp., 412 Investment Bldg., Wash., D. C. W. H. Shoemaker, 1507 M St. N W, Wash., D. C., archt.

▲ **Ralph V. Watts**, Townsend, Del., Separate Contracts, **$1,500,000,** RESIDENTIAL DEVELOPMENT, S. Broad St., MIDDLETOWN, DEL. M. Clive Newton, Odessa, Del., archt.

F. A. Crest, 702 Madison Ave., Wilmington, Del., CA **$700,000,** RESIDENTIAL DEVELOPMENT, Buttonwood Section, NEW CASTLE, DEL. John K. Walters, 816 West St., Wilmington, Del.

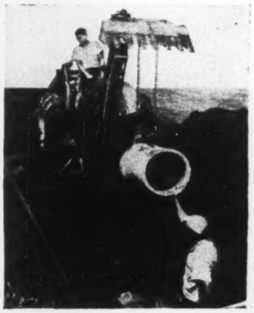
For Many Digging Jobs, *Only* the Sherman *Power* Digger is Practical

Get the most out of the excavating equipment you already own or rent by keeping it on your big volume jobs.

For miscellaneous excavating and trenching jobs the Sherman Power Digger is *fully capable* and *far less expensive to operate.* You can buy Digger and Tractor complete for less than many automobiles cost.

The Sherman Power Digger is the answer where giant digging equipment and manual labor are both uneconomical. It reaches 8 feet below ground surface and swings in an arc of 140° with a radius of 10 feet behind the tractor.

For complete information on how the Sherman will cut your digging costs, write today for free literature C36.



Efficient performance of the Sherman Power Digger is assured by positive hydraulic action and patented actuated bucket.

The Sherman Power Digger is attached to a lightweight, rubber-tired tractor giving unmatched maneuverability and transportability.

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Hubbardston, Mass.

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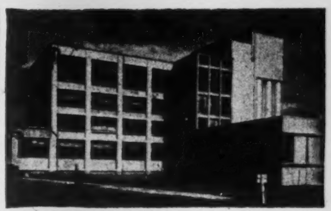

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LOWER COST MAINTENANCE
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DIFFUSED DAYLIGHT
STRENGTH PROTECTION
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Original CORRUGATED
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"PLANgineer" the production benefits of well diffused daylight . . . the beauty and lower maintenance costs of Original CORRUGATED Wire Glass* when you plan your new or modernized Sidewall, Skylight and Sawtooth construction. Complete units of heavy-duty, solid corrugated glass (with wire netting encased) are ready to attach to your plant superstructure. Easily installed, without supplementary frames on steel, wood or concrete. Important installations have proved that Original CORRUGATED Wire Glass has the ability to "take it" under most punishing production conditions. Employees work more happily and efficiently in properly diffused daylight. Our FREE field "PLANgineering" service is ready to help you.

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STRENGTH — many times greater than flat glass of equal thickness.
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BIDS ASKED—HEAVY CONSTRUCTION

▲† **Va., Portsmouth**—RADIO TRANSMITTER FACILITIES—B.A. 9/23—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, radio transmitter facilities, Naval Communications Center, Monogram, NOY 71277, Spec. 32847. $3,000,000. Plans deposit $150. Frank Grad & Sons, 1633 Connecticut Ave. N. W., Wash., D. C. and Marcellus Wright & Son, 100 E. Main St., Richmond, archts. Henry W. Roberts, 100 E. Main St., Richmond, engr.

BIDS ASKED—BUILDINGS

S. C., Beaufort—SCHOOL—B.A. 9/15—Beaufort School Dist. 1, Beaufort, Consolidated Elementary and High School. $634,000. Halsey & Cummings and Wm. Harleston Assoc., Champney's St., Charleston, archts. CD 5/6.

Va., Alexandria — HOTEL—B.A. 9/16 — Thomas H. Meletis, 734 N. St. Asaph St., 7 story, rein.-con, frame, masonry Virginia Hotel, $750,000. Extended date. W. D. Phillips, 128 S. Royal St., archt. Herbert Manuccia, 930 "F" St., N. W. Wash. D. C., engr. CD 8/12.

▲ **Tenn., Knoxville**—RESEARCH CENTER, **etc.—B.A.** 9/20—State Bldg. Comn., State Capitol, Nashville, research center and hospital. $1,500,000. Baumann & Baumann, 813½ Market St., Knoxville, archts. CD

SOON LETS CONTRACT—BUILDINGS

Ala., Birmingham—HOSPITAL—B.A. 9/4—Holy Family Hospital, c/o Pembleton & Mims, archts., Title Guarantee Bldg., soon let contract hospital, $840,000. CD 8/5.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Wise Contg. Co.,** 8 and Grace Sts., Richmond, Va., CA. **$1,137,800,** aviation gasoline and jet fuel storage, U. S. Naval Supply Center, Cheatham Annex, NOY 70223, WILLIAMSBURG, VA. Dpt. Navy, Fifth Naval Dist., U.S. Naval Base, Norfolk, Va. Bids Aug. 5. **(Correction**—contractor). CD 8/12, under CA.

▲† **Tidewater Constr. Co.,** 738 Front St., Norfolk, Va. CA. **$1,283,000,** replacement and enlargement of fuel pier, U. S. Naval Supply Center, NOY 73594, YORKTOWN, VA. Dpt. Navy, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. **(Correction**—Location of project). CD 8/20, under CA, Yorktown, Pa.

(Continued on page 305)

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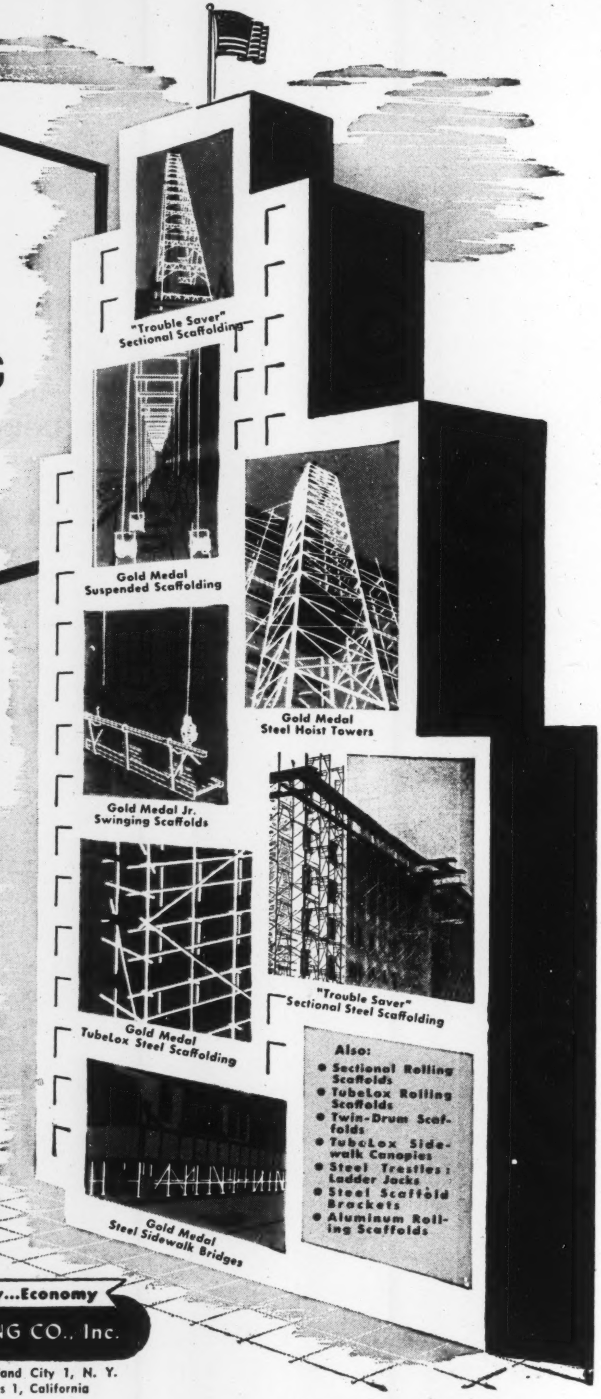
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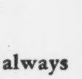

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(Continued from page 302)

GEORGIA—State Hy. Dpt., Atlanta,

Coffee Constr. Co., Eastman, Ga., CA, **$331,437** grading, paving 15.505 mi. S-0508 (4), CT 1 Early and Clay Counties; CA, **$136,816**, grading, paving, new bridge 3.638 mi. S 0550 (3), Irwin Co.; CA, **$90,971**, grading, base surf. 4.891 mi. PR-912 (7), Candler and Emanuel Counties;

Georgia—Alabama Paving Co., Brookhaven Rd., Columbus, Ga., CA, **$134,731**, grading, paving 7.743 mi. S-1630 (1), Baker Co.; CA, **$113,766**, wid'n., resurf. 7.3 mi. SAP-RECON. 1843-B (3), Pulaski Co.;

W. L. Robinson Constr. Co., College Park, Ga., CA, **$74,788**, grading, base, surf. 3.56 mi. **S-0787 (2)**, Hancock Co.;

Mose Gordon Lumber Co., Commerce, Ga. CA, **$77,311** grading, base, surf. 6.034 mi. S **0915 (1), Oglethorpe** Co.;

McIntosh Paving Co., Inc., 305 Luckie St., Atlanta, Ga., CA, **$584,957**, wid'n., resurf. 6.03 mi. F-013-1 (1), Gwinnett and Hall Counties;

Wainer Constr. Co., Inc., Valdosta, Ga., CA, **$177,787** grading, paving 2 bridges, 1.956 mi. S-0802 (3) Jefferson and McDuffie Counties;

W. T. Anderson, Inc., Thomson, Ga., CA, **$185,641** grading, paving. 1 bridge 4.391 mi. S 0906 (2) Lincoln Co.;

Lethridge Brothers, Gainesville, Ga., CA, **$162,678** grading, base, surf. 4.788 mi. S **0692 (2)**, Haralson Co.;

Nello L. Teer Co., Durham, N. C., CA, **$833,822, grading** 7.305 mi. FI-484 (4) CT2, Bartow Co.;

H. M. Pafford, Jr., Waycross, Ga., CA, **$181,123** grading, paving new bridge 1.332 mi. F—FG-001-1 (1), Tift Co.;

C. M. Lyle Constr. Co., Gainesville, Ga., CA, **$107,355** grading, paving 9.43 mi. Pr-1080 (4), Camden Co.;

Davison Asphalt Co., Danielsville, Ga., CA, **$61,271** preparation of base, surf. 11.457 mi. PR-1102-B (8), PR-1121 (8) PR 1391 (2), PR 1541 (1) Madison Co.;

R. A. Bowen, Inc., Macon, Ga., CA, **$65,037**, grading, surf. 4.619 mi. PR 1460 (1), Henry Co. Grand total, $3,319,491. Bids Aug. 8. CD 7/31.

▲† **B. B. McCormick & Sons**, Box 248, Jacksonville, Beach Fla., CA **$2,129,000**, runway, taxiway and apron at Naval Auxiliary Air Station, NOY 71525, SANFORD, FLA. Dpt. Navy, Officer in Charge of Construction, Box 365, Naval Base, S. C. Bids July 24. CD 7/30, under LB.

▲ **Houston Contg. Co.**, 2707 Ferndale St., Houston, Tex. CA Est. **$1,000,000.** 52 mi. 16 in. crude oil trunk line between Sunset Pump Station, St. Landry Parish and Anchorage Terminal, West Baton Rouge Parish, LOUISIANA. Interstate Oil Pipe Line Co., Standard Oil Bldg., Shreveport, La. CD 3/7.

▲ **J. C. Codell Constr. Co.**, Winchester, Ky., CA **$3,028,350**, McCallie Tunnel repairs and new tube in city

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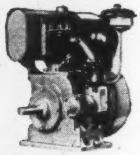
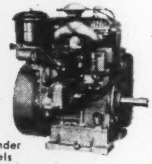
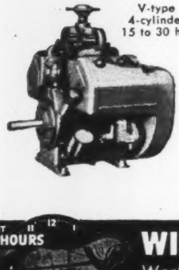


4-cycle single cylinder 6 to 9 hp.



2-cylinder models 7 to 13 hp.



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For powering concrete mixers, pumps, compressors, portable welders, conveyors, concrete cutters, lift trucks, concrete vibrators, concrete surfacers, hoists, saws, electric generating plants and many other types of equipment . . . you will find Wisconsin Air-Cooled Engines cutting costs and speeding up the job everywhere along the construction front.

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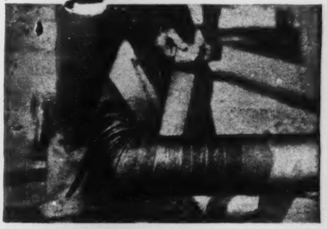

TAPECOAT provides time-tested protection against severe corrosion on gas, oil, water and air piping and on pipe joints, couplings and tanks. It is resistant to moisture, acids and alkalis underground, and is equally dependable against moisture, chemical fumes and other severe conditions above ground. It reduces maintenance, cuts pipe replacement cost—as proved in 11 years of service to industry.

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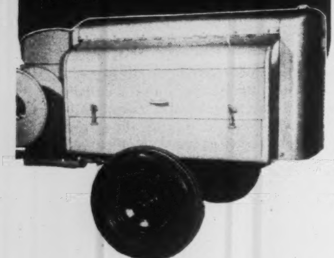

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In high-cost times, look to the Smith for compressor savings! Delivers 105 cu. ft. per minute—combines heavy duty with light weight; easily portable. Powered with the Chrysler Ind. 15 Industrial engine — 6 cyl., 4" bore, 5" stroke, 377 cu. in., 3" crankshaft, 7 main bearings, sodium cooled valves and Stellite valve seats for heavy duty, long life. Compressor valves—stainless steel disc type with Manganese Bronze seats. Improved type pilot valve and simplified control . . . *Write for literature and prices.*

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BOWLING GREEN, KY.

of Chattanooga, Hamilton Co., Proj. SAP .979-A. TENNESSEE. State Hy. Dpt. & P. Wks. Cotton States Bldg., Nashville, Tenn. Bids Aug. 1. CD 8/5, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

English Constr. Co., Main St., Altavista, Va., LB **$777,700.** Clarke County HIGH SCHOOL, BERRYVILLE, VA. Clark Co. School Bd., Berryville, Va. Bids Aug. 14 CD 7/22.

English Constr. Co., Main St., Altavista, Va., LB **$887,400** Robert E. Lee HIGH SCHOOL addns., alterations, STAUNTON, VA. City, Staunton, Va. Bids Aug. 1. CD 7/24.

Mottley Constr. Co., Farmville, Va., LB **$688,240.** Negro HIGH SCHOOL, DINWIDDIE, VA. Dinwiddie County School Bd., Dinwiddie, Va., Bids Aug. 12. CD 7/22.

English Constr. Co., Altavista, Va., LB **$887,400.** Wilson HIGH SCHOOL addns., STAUNTON, VA., Stanton School Bd., Staunton, Va. Bids Aug. 7. CD 7/17.

▲ **Jarvis Courtney Corp.,** 410 Ohio Ave., Clarksburg, W. Va., CA, **$1,500,000,** superstructure for Zinc PLANT Addn. SPELTER, W. VA. Meadowbrook Corp. (subsidiary Mathiesson Hegeler Zinc Co.) Spelter, W. Va. CD 1/24.

R. & R. Land Co., 4165 E. 8 Ave., Hialeah Fla., Owner Builds, **$700,000,** 73 RESIDENCES, HIALEAH, FLA.

Mo-Art Constr. Co., 3142 Coral Way, Miami, Fla., Owner Builds, **$575,000,** 62 RESIDENCES, MIAMI, FLA.

Ivy H. Smith Constr. Co., 1525 San Marco Blvd., Jacksonville, Fla., CA, **$799,994,** POWER and FILTER PLANTS addn., ORLANDO, FLA. Orlando Utilities Comm., Orlando, Fla. Bids July 12.

Caldwell & McCann, Box 477, Baton Rouge, La. CA **$679,987.** 2 story, brick HIGH SCHOOL, LAFAYETTE, LA. Lafayette Parish School Bd., Lafayette, La. Bids Aug. 14. CD 7/24.

Mercantile Stores Co., Inc., 128 W. 31 St., New York, N. Y. Separate Contracts. **$700,000.** 2 story, brick, stone, 18,000 sq. ft. DEPARTMENT STORE, ST. MATTHEWS (BR. LOUISVILLE), KY. Awarded Aug. 1. CD 6/11.

▲ **Blount Bros. Constr. Co.,** Box 1144, Montgomery, Ala. CA. **$1,000,000.** PLANT, BRISTOL, TENN. Sperry-Farragut Corp., c/o Smith, Hinchman & Grylls, Inc., archts., Marquette Bldg., Detroit, Mich. bids July 30. CD 8/5, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OHIO**—State Hy. Dpt., T. J. Kauer, dir., Columbus, Zone 15,

Kane, O'Horo & Haenny, Inc., 65 W. Indianola Ave.,

(Continued on page 309)

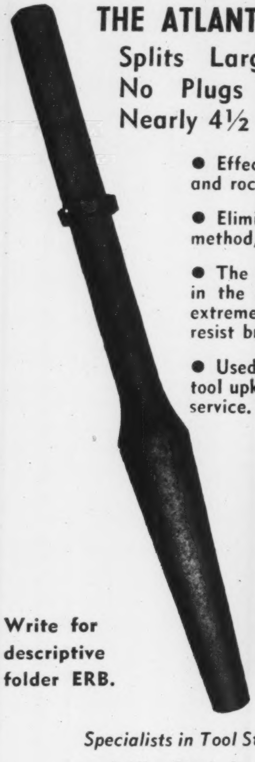
ATLANTIC Pneumatic TOOLS

Use with your standard power pavement equipment . . . .

THE ATLANTIC PNEUMATIC ROCK BREAKER

Splits Large Rocks and Boulders quickly
No Plugs and Feathers — No Explosives
Nearly 4½ times faster

- Effective quick action in removing stones, boulders and rocks from excavations and ditches.
- Eliminates the slow and costly plug and feather method, and the risky and troublesome use of explosives.
- The specially heat-treated Atlantic Tool Steel used in the Atlantic Pneumatic Rock Breaker gives it the extreme toughness to withstand the severest usage and resist breakage regardless of the hardness of the stone.
- Used with standard power pavement breakers. No tool upkeep. Toughter than any stone. A size for every service.



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Non-tempering tool steels for greater safety and speed.

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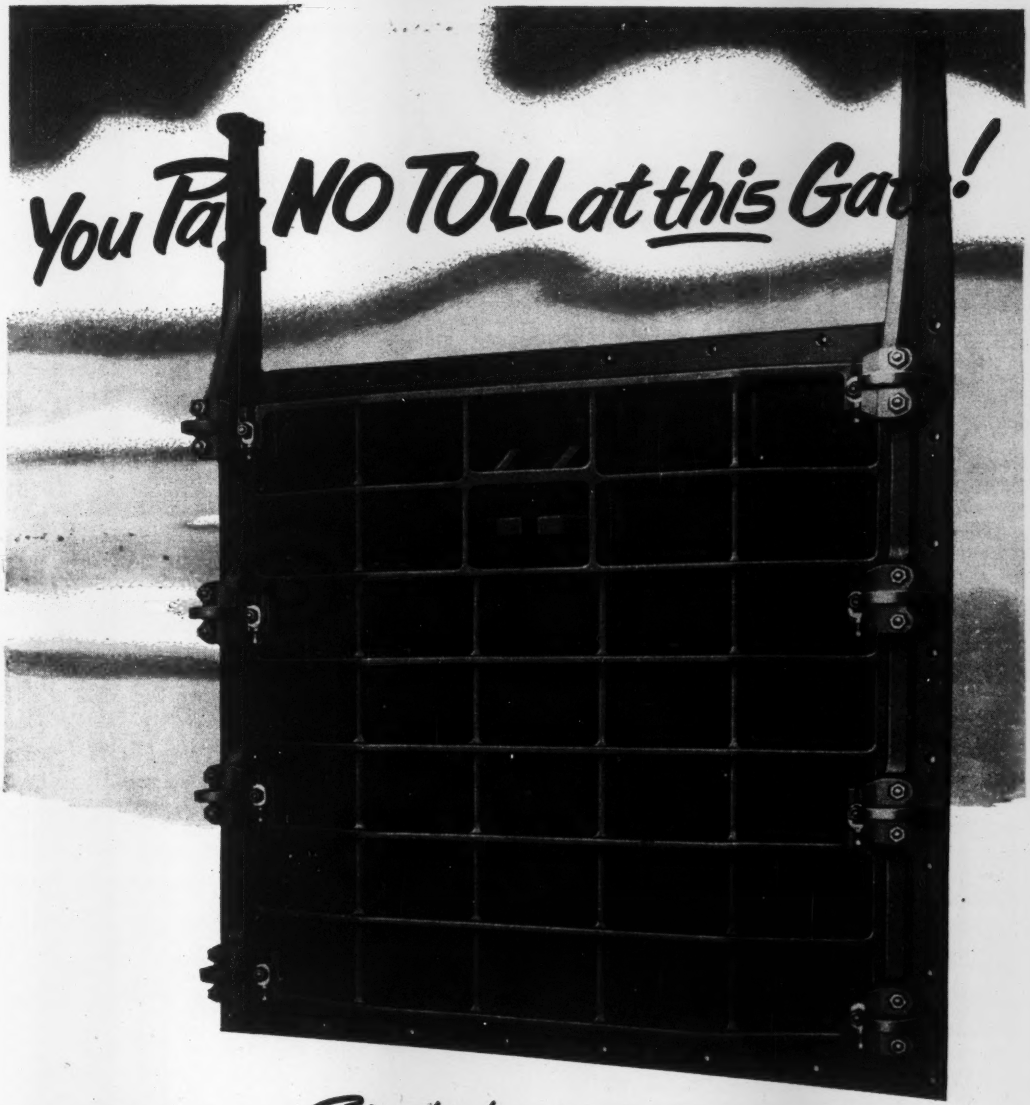

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NO TOLL under usual operating conditions . . . because Chapman Sluice Gates have been standardized to meet *all* these conditions. And even for *special* conditions, many designs and patterns are available *at no extra cost.*

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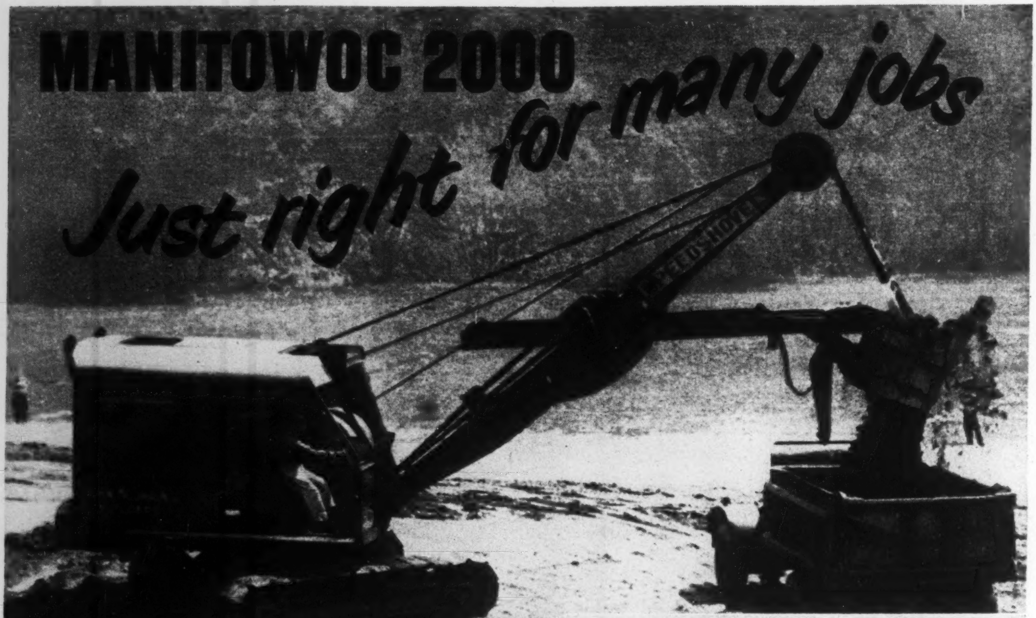
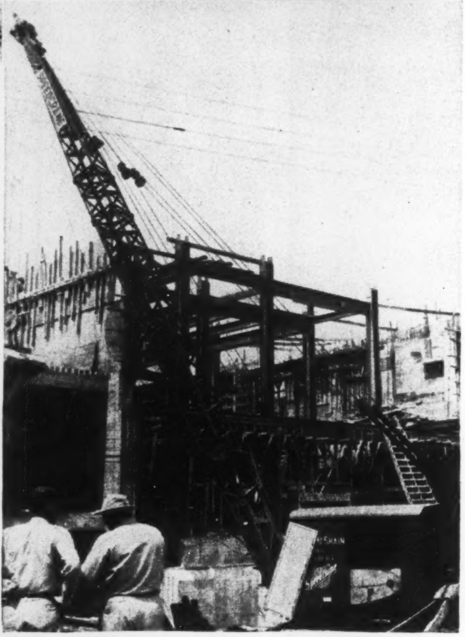


Here's a 1¼ yard excavator that's the equal of many machines a size larger, in capacity, in power, stability and performance.

- Maximum safe lift is 25½ tons at 12′ radius.
- Speed means more work capacity. Compare hoist speeds as high as 227′/min., swing 4.35 R.P.M., and travel 1.1 M.P.H.
- More power at the dipper. Only 13 gears; only working gears turn—greater efficiency, less trouble and more effective horsepower.
- Easily moved on trailers or flat car.

It's the best buy, by far in the 1¼ yard class. That's why more and more contractors are switching over to fleets of these husky 2000's every day. Manitowoc Engineering Corp., Manitowoc, Wis.



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Speedcrane

SHOVELS
1-5 YD.

CRANES
18-100 TON

One of the 4 Manitowoc 2000's owned by John McShain, Inc., Wash., D.C., excavating for Georgetown University Athletic Field.

Another Model 2000 placing concrete at Naval Health Institute, Bethesda, Maryland.

(Continued from page 306)

Youngstown, O., LB **$170,673,** Type T-35 on B-20 and structure 0.672 mi. SR 45 (14.64-14.85), S-470 (2). Ashtabula Co.;

A. J. Baltes, Inc., 11 Olive St., Norwalk, O., LB **$539,081** est. $517,600, Type T-71 and structure 2.428 mi. SR 14-8.87, FI-979 (3), (Columbiana-Mahoning), (Village of Columbiana), Columbiana Co.;

The W. M. Brode Co., 1st Natl. Bank Bldg., Newcomerstown, O., LB **$399,904,** est. $411,280, Type T-35 and structures 0.236 mi. USR 62-0.44, F-FG-978 (4), (Columbiana-Mahoning), Columbiana Co.;

National Engineering & Contg. Co., West Fourth and Central Ave., Cleveland, O., LB **$2,659,624** est. $3,280,900. Type T-71, T-50 and structures 2.594 mi. SR 2-18.67, UI-329 (6), (City of Cleveland), Part No. 2). Cuyahoga Co.;

Great Lakes Constr. Co., Box 2278 Brooklyn Station, Cleveland, O., LB **$72,979,** est. $60,760, Type T-71 and structure 0.153 mi. CR Nos. 82 and 96, S-8 (4), (Village of Valley View), Cuyahoga Co.;

Harper Supply, Inc., 118 W. Front St., Napoleon, O., LB **$63,050** est. $78,430, Type T-32 on B-20, 0.74 mi. SR 66-(8.58), (10.58), (14.73), S-113 (1), Defiance Co.;

S. E. Johnson Co., Box 29, Maumee, O., LB **$71,840,** est. $74,850, Type T-32, 2.274 mi. CR 175, S-1103 (1), Defiance Co.;

Herman B. Hune, Williamstown, W. Va., LB **$341,355,** est. $314,250, Type T-32 on B-113, 4.713 mi. SR 278-0.00, (8.68-9.12), S-919 (6), Hocking and Vinton Counties;

McNamara & Reder, R. D. No. 4, Delaware, O., LB **$230,716,** est. $268,850, Type T-35 and structure 1.366 mi. SR 49-(4.77), (7.44), S-124 (4), Mercer Co.; LB **$91,475,** est. $118,240, Type T-32 on B-11 and structure 0.572 mi. CR 7, S-1058 (1), Pickaway Co.;

Tri-State Asphalt Corp., South Broadway, Martins Ferry, O., LB **$63,961,** est. $64,700, Type T-30, B-35 and T-35 6.3 mi., Belmont Co.; LB $76;616. est. $75,187, Type T-30, B-35 and T-35, patching, 20.005 mi., Guernsey Co.;

The F. H. Brewer Co., P. O. Box 372, Lancaster, O., LB **$105,717,** est. $126,810, Type T-30, B-35 and T-35, 13.48 mi. Fairfield, Franklin and Pickaway Counties.

Ohio Road Improvement Co., Chamber Commerce Bldg., Columbus, O., LB. **$61,821,** Type T-30, B-35 and T-35, 4.83 mi. Medina Co.; LB. **$200,464,** est. $260,000. Type T-30, B-35 and T-35, 10.188 mi. Wayne Co.;

The McCourt Constr. Co., 720 Home Ave., Akron, O., LB. **$85,223,** est. $99,104, Type T-30, B-35 and T-35, 3 mi. Summit Co.; LB. **$86,073,** Type T-30, T-35 10.9 mi., Wayne Co.;

Fenton Constr. Co., P.O. Box 310, Ashland, O., LB. **$131,734.** est. $169,200, Type T-30, B-35 and T-35, 12.539 mi. Union Co.;

received no bids Aug. 12, Type T-50 on B-71 and structures **0.771** mi. SR 46-(3.35-3.65); SR 169-

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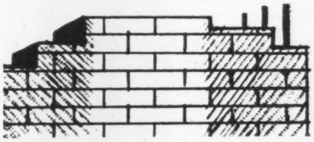

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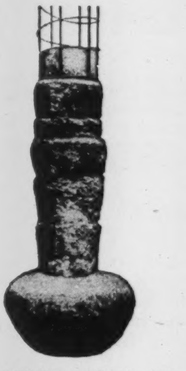

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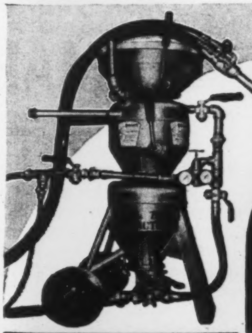

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(2.14-2.74), U-UG-635 (4), U-1098 (1), City of Niles, Trumbull Co. Bids Aug. 12. CD 7/28 .

INDIANA—State Hy. Comn., Indianapolis,
Harold Tharp, Fountain City, Ind., CA. **$784,992**, est. $936,549, rein.-con., steel beam overhead bridge over Penna. Ry., Richmond, Wayne Co. Bids July 15, awarded Aug. 13. CD 7/21, under LB.

INDIANA—State Hy. Comn., Indianapolis,
Bontrager Constr. Co., 618 W. Indiana Ave., Elkhart, Ind., CA. **$751,451**, est. $867,949, paving, grading, drainage State Rd. 31, from west of Columbus thru Edinburg to Johnson Co. line, Bartholomew and Johnson Counties. Bids Aug. 12. CD 7/28.

ILLINOIS—State Div. Hys., Springfield,
Bushman Constr. Co., 4638 Mill Creek Parkway Kansas City, 2 Mo., CA, **$668,609**, c. conc. 3.47 mi. and 1 bridge on U. S. 36, Morgan Co. Bids Aug. 6, awarded Aug. 18. CD 8/11, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Ebasco Services, Inc.**, 2 Rector St., New York, N. Y. CA approx. **$120,000,000.** 800,000 kw GENERATING PLANT. with four 200,000 kw. steam generating units, near Portsmouth, OHIO. Ohio Valley Power Corp., (combination of fifteen companies) Portsmouth, O. CD 8/18.

▲ **James Road Development Co.**, 297 S. High St., Columbus, O. Owner Builds. **$1,000,000.** 1 story, concrete masonry 18-storeroom James Road BUSINESS CENTER **$4,500,000,** 150-frame HOMES; forty 4-family brick apartments 50 twin-single homes as residential addn. to James Road Business Center, COLUMBUS, O. C. Melvin Frank, 43 W. Long St., Columbus, O., archt.

F. L. Palmer & Son, 212 N. Delaware St., Indianapolis, Ind., Owner Builds. **$700,000,** 49 HOMES, Keesler Blvd. Addition, INDIANAPOLIS, IND.

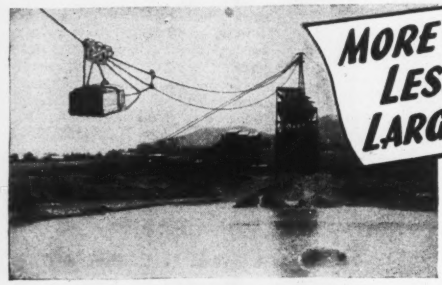
▲ **American Community Builders, Inc.**, 105 W. Monroe St., Chicago, 3, Ill. Owner Builds. **$30,000,000.** 1720 HOMES, PARK FOREST, ILL. Awarded July 1. **(Correction**—address of owner). CD 7/17, under CA.

Kroening Eng. Corp., 4500 W. Mitchell St., Milwaukee, Zone 14, Wis., CA. **$950,000,** remodeling BANK, MILWAUKEE, WIS. Marshall & Ilsley Bank, 721 N. Water St., Milwaukee, 2 Wis. W. G. Knoebel, 906 Sidney St., St. Louis, Mo., archt. Bids July 23. CD 7/2.

Henry DeKoning Constr. Co., 320 Municipal Court Bldg., Ann Arbor, Mich. CA. Est. **$750,000.** 4 story, brick, steel, concrete mental HOSPITAL, ANN ARBOR, MICH. Mercywood Hospital, Sisters of Mercy, Ann Arbor, Mich.

(Continued on page 313)

MORE YARDAGE LESS LABOR LARGER PROFITS



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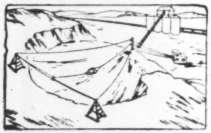

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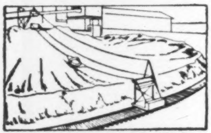

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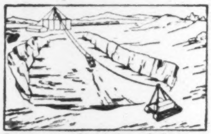

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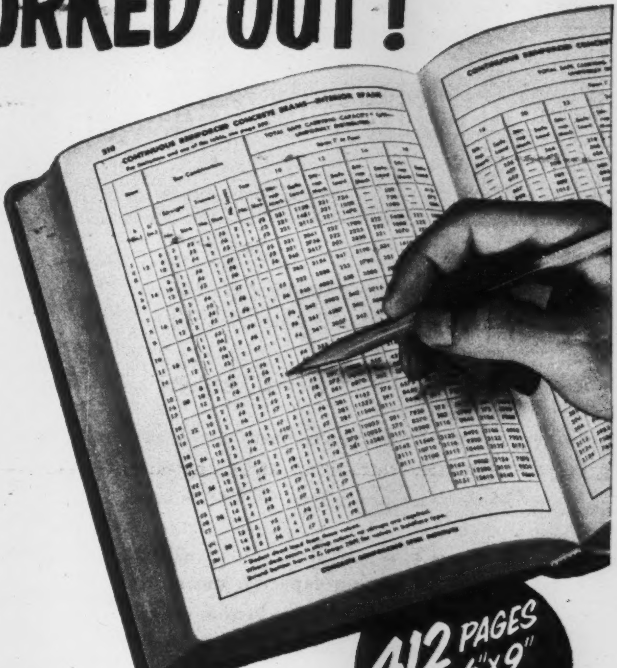

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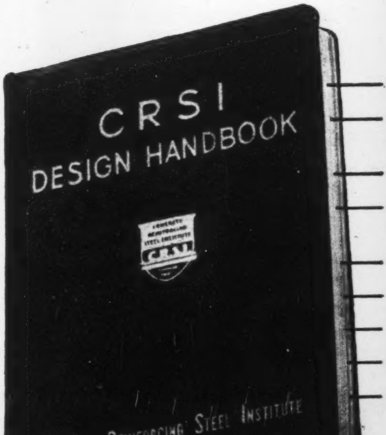

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(Continued from page 310)

▲ **Robertson Brothers**, 4330 N. Woodward St., Royal Oak, Mich. Owner Builds. **$2,000,000.** brick, frame HOUSING, Pine Hill, Adams and Wattles Rd., BIRMINGHAM, MICH.

▲ **Miller-Davis Co.**, 1029 Portage St., Kalamazoo, Mich. CA. Est. **$3,000,000.** brick, steel, concrete mfg. PLANT for magnets, radar, radio, television, EDMORE, MICH. Carboloy Co., Inc., K. R. Beardslee, pres., 11177 E. 8 Mile Rd., Detroit, Mich. CD 7/25.

Hatzel & Buehler, Inc., 862 Penobscot Bldg., Detroit, Mich. CA. **$622,150.** electrical contract municipal POWER expansion, addn., alterations, imprvs., etc., Moores Park Station, LANSING, MICH. City, O. E. Eckert, Bd. Light Comr., City Hall, Lansing, Mich. Burns & Roe, Inc., 233 Broadway, New York, N. Y., engrs. CD 11/12/51.

Hallmark Building Co., Mt. Clemens, Mich. CA. Est. **$750,000.** 75 HOUSING units, Gratiot Rd., MT. CLEMENS, MICH. Houseman-Spitzley Corp., 406 Washington Bldg., Detroit, Mich.

Christman Constr. Co., 408 Kalamazoo Plaza, Lansing, Mich. CA. **$670,329.** general contr. 2 story, brick, steel, concrete tuberculosis unit at Travers City State Hospital, TRAVERSE CITY, MICH. State, A. N. Langius, dir., State Bldg. Dpt., Lansing, Mich. CD 7/30, under LB.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

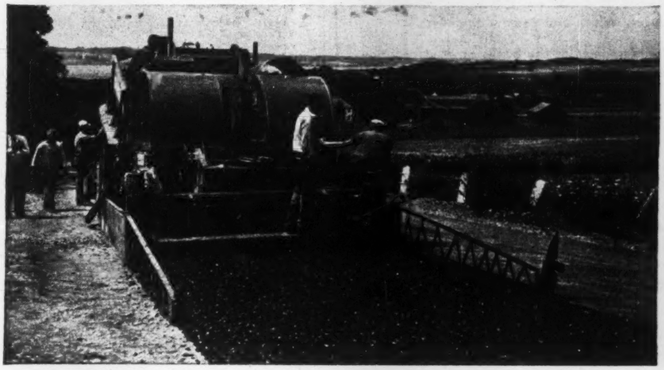
▲ † **Kansas**—B.A. [illegible] 601 Davidson Bldg., Kansas City 8, Mo., initial contract Tuttle Creek Dam excav., dam, spillway, earth fill, concrete, bridge, etc., near Manhattan, $5,000,000, B. V. Reany, 1121 Moro St., Manhattan, proj. engr. CD 7/16.

BIDS ASKED—BUILDINGS

▲ **Tex., Houston**—DORMITORY, etc.—B.A. 9/16—Texas Southern University, 3801 Wheeler St., 324-student capacity men's dormitory, $450,000; 375 student capacity women's dormitory, $750,000; student union, $350,000. Cato, Austin & Evans, 2103 Crawford St., archts. CD 8/20.

Tex., Dallas—SCHOOL—B.A. 9/23—Dallas Independent School Dist., 3700 Ross St., 800-student elementary school (Foster School). $650,000. Plans deposit $25. Bennett & Crittenden, 2812 Fairmount St., and Mark Lemmon, 1210 Main St., Dallas, archts. CD 12/12/51.

Tex., Conroe—HOSPITAL—B.A. 9/30—Montgomery Co., Conroe, 3 story, 15,000 sq. ft. brick hospital addn., concrete frame and fdn., air-conditioning, etc. $550,000. Arnie G. Engberg, 3810 Fannin St., Houston, archt. W. P. Moore, 4605 Montrose St., and Howard & Johnson, 1011 Scanlan Bldg., Houston, engrs. CD 3/25.



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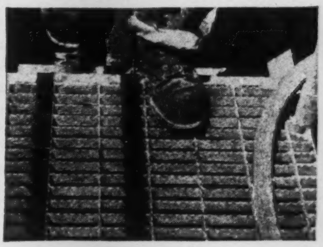

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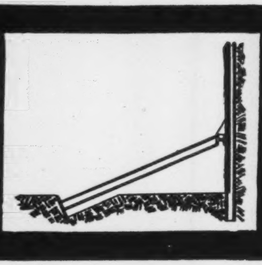

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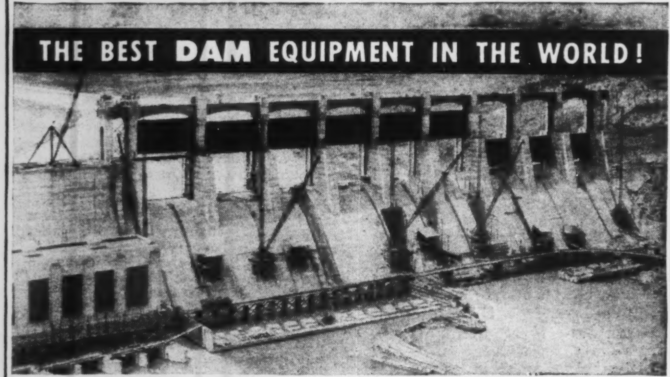

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▲ **Mo., Kansas City**—HOUSING—B.A. 9/26—Kansas City Housing Auth., 414 E. 12 St., Guinotte Manor Housing, incl. 58 bldgs., containing 454 units, $5,-041,105, Keene & Simpson, 15 W. 10 St., Kansas City, Mo., archts. CD 5/3/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Kansas-Nebraska Natural Gas Co.,** Phillipsburg, Kan. Owner Builds. **$2,576,681,** construction or replacement 179 mi. pipe line in NEBRASKA and KANSAS. S. D. Ford, c/o owner, ch. engr. CD 11/30/50.

† **Cunningham-Kiewit Co.,** 4229 Lafayette St., Omaha, Nebr., CA, **$514,817,** rebuilding dikes and revetment adjacent to Missouri River at Narrows-Copeland Bend, near Plattsmouth, Neb., Inv. 25-066-53-19, IOWA and NEBRASKA. U. S. Eng., 1609 Jackson St., Omaha, Neb. Bids Aug. 5. CD 8/13, under LB.

▲† **Word-Texas-Dellinger,** Box 4227, Corpus Christi, Tex., LB **$877,640,** (a), heavy-duty runway; LB **$479,160,** (b) heavy-duty parallel taxiway; LB **$287,150** (c) 2 short heavy duty connecting taxiways; LB **$109,116,** (d) heavy duty plant parking aprons; LB **$69,000** (e) storm drainage addns.; LB **$125,100** (f), related misc. items, incl. grubbing, grading, underground electrical ducts, replacing concrete and flexible pavement, Chase Field Naval Auxiliary Air Station, NOY 71641, BEEVILLE, TEX. U. S. Govt., Officer in Charge of Construction, Admin. Bldg. No. 1, Naval Air Station, Corpus Christi, Tex. Bids Aug. 15. CD 8/5.

▲ **Brazos River Harbor Navigation Dist.,** Freeport, Tex. cancelled bids to have been opened Aug. 18, railway track, est. **$75,000;** new harbor slip, est. **$1,500,000,** FREEPORT, TEX.

Texas Bitulithic Co., 2121 Irving Blvd., Dallas, Tex., LB **$838,348,** est. $850,000. 16 mi. streets, concrete curbs and gutters, 6 in. compacted caliche base, c. conc. pavement, hot mix b. conc. pavement, etc. MIDLAND, TEX. City, Midland, Tex. Bids Aug. 11. CD 7/28.

BUILDINGS

LOW BIDS AND CONTRACTS

C. O. Field Co., 2940 Harriet Ave., Minneapolis, Minn. LB Approx. **$710,000.** general and mechanical contracts. 2 story, 242x282 ft. WAREHOUSE and OFFICE, NEW BRIGHTON, MINN. Marshall-Wells Co., New Brighton, Minn. Bids July 18. CD 7/16.

Swedburg Constr. Co., Detroit Lakes, Minn. CA **$511,-751.** general contract SCHOOL, WARREN, MINN. Bd. Educ., S. C. Olson, clk., Warren, Minn. CD 8/13 under LB.

Kucharo & Assocs., Jewett Bldg., Des Moines, Ia., CA, **$660,280,** general contract, Technical SCHOOL and GYMNASIUM addn. to high school DUBUQUE, IA.

(Continued on page 317)

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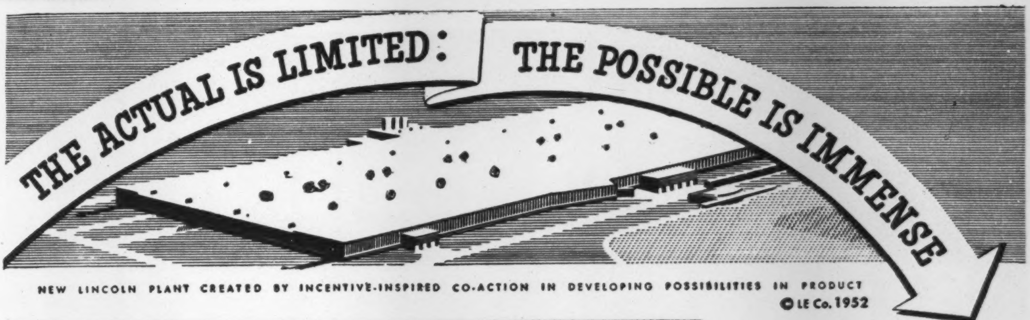
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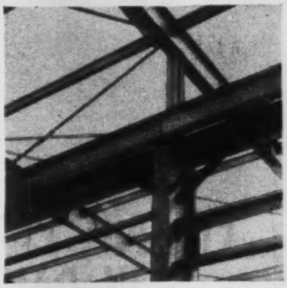

Fig. 1—Simpler Details *Method for attaching crane girders to beam columns. Small stub column welded to top of W. F. beam supports roof girder construction.*

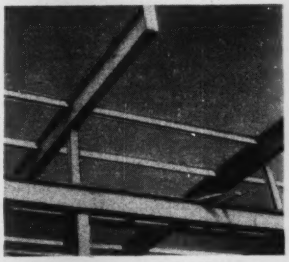

Fig. 2—Simpler Erection *Cantilevered ends of roof girders project out from 50' and 70' bays and over the 85' bay are ready to receive the 30" girder to complete the 85' span.*

HERE'S HOW

WELDED DESIGN COSTS 28% LESS ...CUTS STEEL REQUIREMENTS 21%

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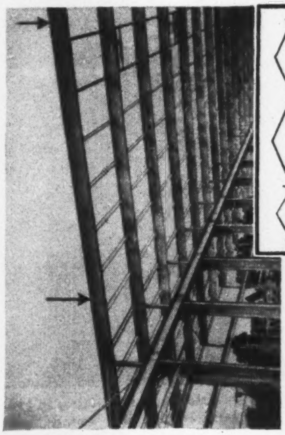
Structural Engineer, Baltimore, Maryland

RIGID frame construction using welded design has saved 134 tons of steel and $41,246 on this industrial warehouse. These figures represent a cost reduction of 28% with steel savings of 21% over riveted construction.

The original design contemplated pitched roof trusses over the entire roof area, ranging in depth according to the spans which were 50', 85' and 70'. However, to save on fabricating time a design was developed using continuous girders over columns so the entire roof girder structure could be developed using 30" depth beams of varying weights over the spans.

Of five bids submitted, the low bid was $26 per ton less than the lowest bid on riveted construction. All steel was to be furnished by the owner except for angles and plates for the riveted design which were to be supplied by the bidder. The bid of the low fabricator for riveting was $150 per ton with 40 additional tons of steel needed for connections. The welding fabricator's bid was only $124 per ton including all welding rod and equipment.



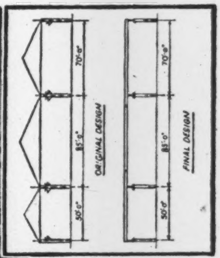


Fig. 3—Continuous Framing *for the 85' bay with 30" girderbeams attached to the cantilevers at arrows. Steel warehouse is for A. M. Castle Company. Architect: Lucius R. White Jr.; Fabricator and Erector: Reading Steel Products.*

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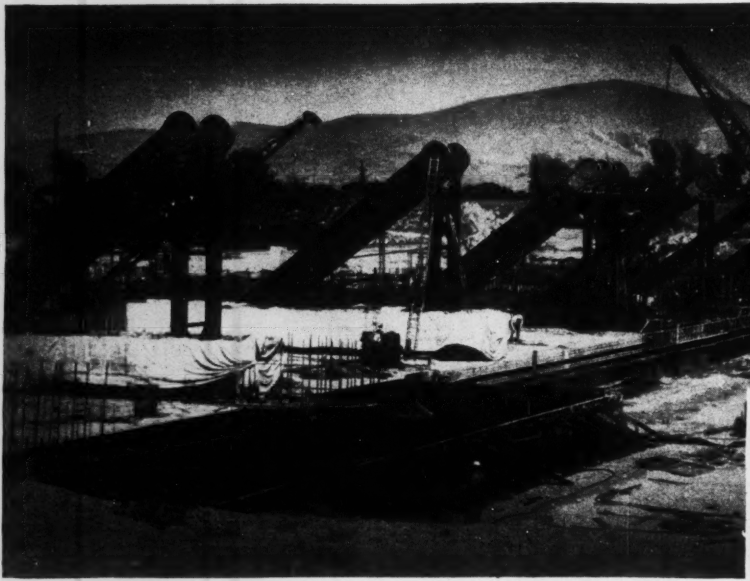
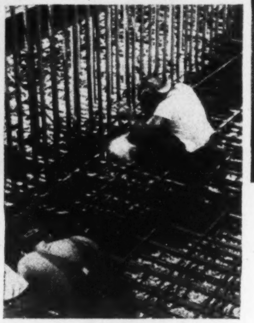


General view of Whittier Narrows Dam in California showing construction forms for base slabs for radial gate trunnion anchors.



Positioning and "tieing in" reinforcing steel using preplaced aggregate as a working platform.

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Versatile PREPAKT methods and materials proved to be the best answer to the construction of the 8-foot thick base slab at Whittier Narrows Dam in California, where each of nine 182′ x 37′ x 8′ monoliths was PREPAKT-constructed in one "pump". Each of the nine slabs contained 2,000 cu. yds. of PREPAKT concrete with a total of 18,000 cu. yds.

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The preplacing of coarse aggregate permitted accurate positioning and easy installation of the reinforcing steel.

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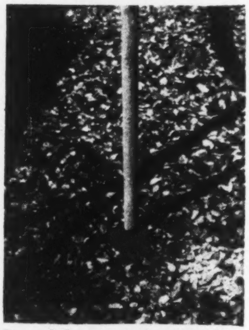

One of the grout pipes used to fill voids to produce PREPAKT concrete at a rate of 100 cu. yds. per hour.

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(Continued from page 314)

Bd. Directors Independent School Dist., Dubuque, Ia. Bids Aug. 6. CD 7/22.

Conlon Constr. Co., 240 Railroad Ave., Dubuque, Ia., CA, **$741,726,** general contract, DORMITORY for seminary, DUBUQUE, IA. Mt. St. Bernard Seminary, Asbury Rd., Dubuque, Ia. Bids Aug. 1. CD 7/30.

R. G. Aldridge, 1610 Nebraska St., Kansas City, Kan. CA **$600,000.** intake structures for new Kaw POWER STATION, 20 and Kansas Ave., KANSAS CITY, KAN. Bd. P. Utilities, City Hall, Kansas City, Kan. Bids Aug. 6, awarded Aug. 13. CD 7/31.

McClellan-Brown-McClellan Constr. Co., Waco, Tex. CA **$538,990.** Y. M. C. A. bldg., WACO, TEX. Young Mens' Christian Assn., Waco, Tex. Bids June 20, awarded Aug. 9. CD 7/2, under CA.

▲ **Blaw-Knox Co.,** Farmers Bank Bldg., Pittsburgh, Pa. CA design and construct catalytic polymerization unit and waste heat boiler auxiliary at REFINERY, BILLINGS, MONT. Carter Oil Co., Billings, Mont.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Calif., Los Angeles**—CENTER—B.A. 9/17—Jewish Centers Assoc., 590 N. Vermont St., 3 story, rein.-con. center bldg., Olympic and Stanley Sts., $1,250,000. Eisenshtat, Lipman & Reisbord, 1121 S. Hill St., engrs. CD 1/9.

SOON LETS CONTRACT—BUILDINGS

▲ **Calif., Van Nuys**—SEMINARY—Roman Catholic Archbishop of Los Angeles, 1531 W. 9 St., Los Angeles, soon lets contract rein.-con. Junior Seminary, $1,250,000. Montgomery & Mullay, 1109 N. Vermont Ave., Los Angeles, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **James E. Roberts,** San Bernardino, Calif., CA **$90,000,** gravel road surf. for Mohawk Canal, Station 0 plus 00 to 20 plus 00, 1250 plus 00 to 2052 plus 00 to 2052 plus 00 Wellton Canal, Station 1 plus 00 to 618 plus 00 and earthwork for Ligurta creek dike, Gila Proj., Spec. 300C-39, ARIZONA. Bureau Reclamation, Dpt. Interior, Yuma, Ariz. Bids July 31, awarded Aug. 5. CD 7/23.

▲† **M. M. Sundt Constr. Co.,** 440 Park Ave., Tucson, Ariz., CA, **$3,104,805,** airmens dormitories, Davis-Monthan Air Force Base, Eng 04-353-52-78, TUCSON, ARIZ. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Aug. 15.

G. E. Teufel Co., Henry Bldg., Seattle, 1, Wash., CA, **$503,000,** est. $600,000, 160x120 ft. steel, rein.-con. hangar with 30 ft. second story for office, SEATTLE, WASH. Pan-American World Airways, Boeing Field, Seattle, Wash. Bids Aug. 12. CD 8/18, under LB.

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▲† **H. Earl Parker, Inc.,** 12 and F Sts., Marysville, Calif., CA Sch. 1, **$675,221;** Sch. 2, **$1,429,923,** earthwork, structures, etc. portions of Madera Distr. Sys., Central Valley Proj. 14 mi. nw. of Fresno, Spec. DC 3721, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Friant, Calif. Bids June 17. CD 6/24, under LB.

▲† **R. V. Lloyd & Co.,** Coachella, Calif., LB Sch. 1, **$2,574,800,** est. $2,586,886;

W. E. Kier Constr. Co., Spreckels Bldg., San Diego, Calif., LB, Sch. 2, **$2,031,414,** est. $1,791,101;

Johnson-Western Constructors, 2100 Wilmington St. and San Pedro Rd., San Pedro, Calif., LB, Sch. 3, **$3,123,326,** est. $1,956,511, earthwork, pipe line and structures North Station 138 plus 86 to North Station 1901 plus 60, San Jacinto-San Vicente Aqueduct, Spec. DC 3754, 9 mi. southwest of Fallbrook, CALIFORNIA Bureau Reclamation, c/o Distr. P. Wks. Officer, Eleventh Naval Dist., 1220 Pacific Hy., San Diego, Calif. Bids Aug. 20. CD 8/13.

▲ **The Shea Co.,** 2801 W. Mission Rd., Alhambra, Calif., LB, **$1,598,806,** Cajalco Tunnel for lower feeder of Colorado River Aqueduct, LOS ANGELES, CALIF. Metropolitan Water Dist. of Southern California, 306 W. 3 St., Los Angeles, Calif. Bids Aug. 14. CD 7/22.

† **A. J. Peters & Son,** 534 Stockton Ave., San Jose, Calif., CA, **$521,411,** auxiliary system for 8 ft. supersonic wind tunnel, Spec. A-8250, MOFFETT FIELD, CALIF. National Advisory Comn. for Aeronautics, Moffett Field, Calif. Bids July 28, awarded Aug. 12. CD 8/8, under LB.

† **Del E. Webb Constr. Co.,** P. O. Box 4066, Phoenix, Ariz., CA, **$667,270,** aircraft shops, Spec. 1626, TRAVIS AIR FORCE BASE, CALIF. U. S. Eng., Wright Bldg., Sacramento, Calif. Bids July 31, Awarded Aug. 13. CD 8/8, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Olson & Wells,** 1608 Mission St., South Pasadena, Calif., CA, **$1,120,000,** 112 frame, stucco DWELLINGS in Mahama Jr. and Rex. L. Gossett, 1608 Mission St., South Pasadena, Calif. Cain & McKerracher, 2110 E. Walnut St., Pasadena, engrs.

▲† **Gust K. Newberg Constr. Co.,** 2040 N. Ashland St., Chicago, Ill., LB **$17,987,000,** general contract;

(Continued on page 321)

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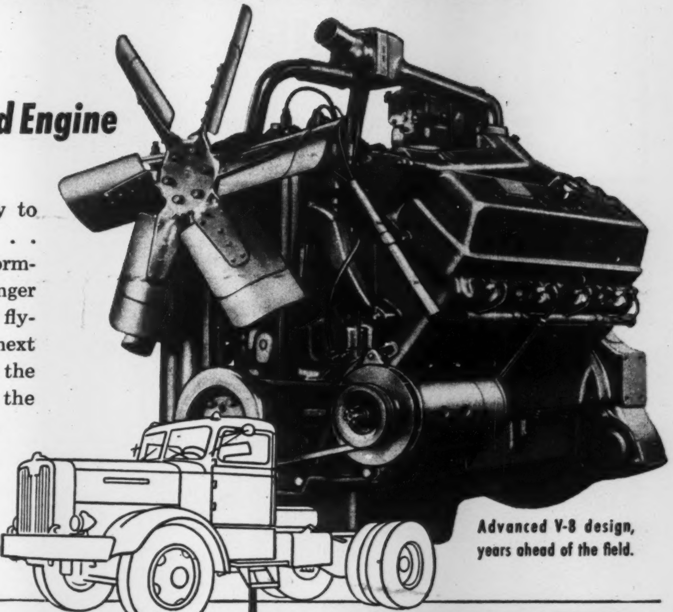

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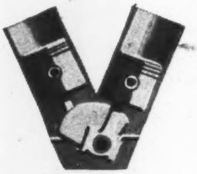

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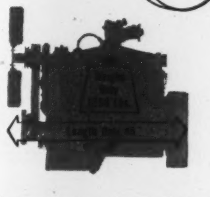

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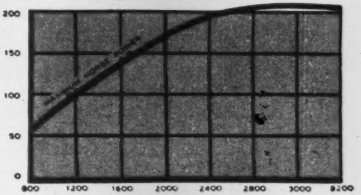

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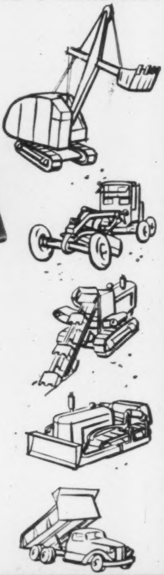

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(Continued from page 318)

Elevator Maintenance Co., Ltd., 1316 Glendale Blvd., Los Angeles, Calif., LB, **$377,300** elevators and dumbwaiters for Veterans HOSPITAL, LOS ANGELES, CALIF. Veterans Admin., Vermont Ave., Munitions Bldg., Wash., D. C. Bids Aug. 19. CD 7/30.

▲ **Baruch Corp.**, 321 S. San Vicente Blvd., Los Angeles, Calif., LB, **$1,603,000**, 5 story, rein.-con., LIFE SCIENCES Bldg. No. 2, LOS ANGELES, CALIF. University of California, 405 Hilgard Ave., Los Angeles, Calif. Bids Aug. 12. CD 7/21.

▲ **Continental & Heller Constr. Companies**, P. O. Box 2551, Sacramento, Calif, CA, **$1,101,000**, general contract, State PRINTING PLANT, SACRAMENTO, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif. Bids July 29, awarded Aug. 13. CD 8/5, under LB.

▲ **J. H. Pomeroy Co., Inc.**, 333 Montgomery St., San Francisco, CA, **$5,000,000**, PLANT for aluminia catalysts for petroleum refining, VERNON, CALIF. Filtrol Corp., 272 W. 7 St., Los Angeles, Calif.

Harry Brittain, Inc., 10542 S. Gunn Ave., Whittier, Calif., Owner Builds, **$986,200**, 128 frame, stucco DWELLINGS on Fernview, Fielding, Jenkins, Kibbeer, Lashburn and Mayes Sts., WHITTIER, CALIF.

ALASKA

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LOW BIDS AND CONTRACTS

▲† **Boen-Sealand Constructors**, 3647 Stone Way, Seattle 3, Wash. CA, **$2,466,118**, 16 eight-family living quarters, Eielson Air Force Base, ENG 95-507-52-43, ALASKA. U. S. Eng., 3013 Arcade Bldg., Seattle 1, Wash. Bids July 29. CD 8/7, under LB.

▲† **Peter Kiewit Sons Co. & Fred J. Early Co.**, 1300 Aloha St., Seattle, Wash., LB. **$2,334,636**, est. $3,030,477, 2 story concrete bsmnt., 47x142 ft., bachelor officers' quarters Eielson Air Force Base, ENG 95-507-52-14, ALASKA. U. S. Eng., 3013 Arcade Bldg., Seattle 1, Wash. Bids Aug. 15. CD 8/8.

† **Chris Berg & Assoc.**, 2730 Westlake Ave. N., Seattle, Wash., CA. **$665,000**. tactical troop facilities, Inv. 53-5, Ladd Air Force Base, ALASKA. U. S. Eng., Anchorage, Alaska. Bids July 29. CD 8/7, under LB.

† **Arctic Plumbing & Heating Co.**, Fairbanks, Alaska, CA. **$568,494**. water sys., PALMER, ALASKA. Alaska P. Wks., Dpt. Interior, Juneau, Alaska. Bids July 1. CD 7/10, under LB.

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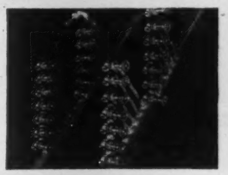

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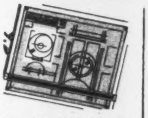

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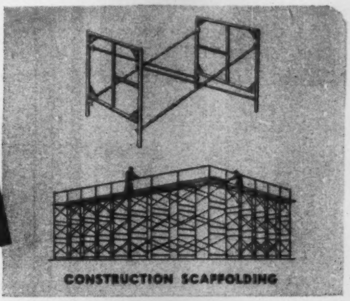

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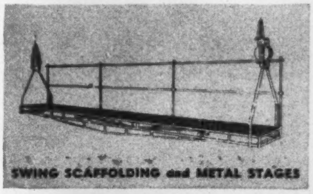

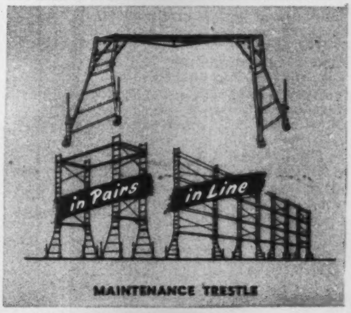

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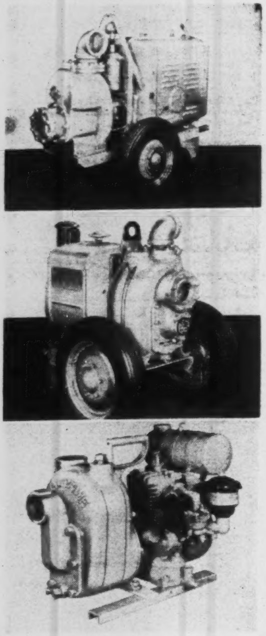

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CANADA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **M. Sullivan & Son Ltd.**, 234 Elgin St., Arnprior, Ont., LB, **$1,344,447**, 2 story, bsmnt., 149x207 ft., rein.-con. frame, brick PUBLIC BLDG., PETERBOROUGH, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids July 30. CD 7/9.

Montclair Constr. Co., 5515 Western Ave., Montreal, Que., CA. **$609,500**, rein.-con., steel, masonry SCHOOL, Victoria St., MONTREAL, QUE. Protestant Bd. School Comrs., 3460 McTavish St., Montreal, Que. Bids July 15. CD 8/21, under LB.

L. Vadeboncoeur, 2329 Ste. Anne St., St. Hyacinthe, Que., CA, **$708,000**, concrete, steel, masonry technical SCHOOL addn., ST. HYACINTHE, QUE. Technical Corp. of St. Hyacinthe, 7 Laframbois St., St. Hyacinthe, Que. S. A. Cyr, 490 Ste. Anne St., St. Hyacinthe, archt. Beaubieu & Le Bel, 4151 W. Sherbrooke St., Montreal, Que., engrs.

A. F. Byers Constr. Co., Ltd., 5675 Western Ave., Montreal, Que., CA, **$500,000**, PLANT ALTERATIONS, Wanklyn St., VILLE LA SALLE, QUE. Peacock Bros. Ltd., 260 St. Patrick St., Montreal, Que. H. R. Wiggs, 1411 Crescent St., Montreal, Que.

U. S. POSSESSIONS

BIDS ASKED—HEAVY CONSTRUCTION

Puerto Rico—AIRPORT—B.A. 9/15—The Puerto Rico Transportation Auth., San Juan, installing electrical equip. and communications, water supply sys. and sewer for Isla Verde International Airport, near San Juan. $700,000. CD 9/5/50.

▲ **Puerto Rico**—AIRPORT—B.A. 11/1—The Puerto Rico Transportation Auth., San Juan, terminal bldg. at Isla Verde International Airport near San Juan. $3,000,000. CD 9/5/50.

FOREIGN

BIDS ASKED—BUILDINGS

Burma—Bids Asked—Union of Burma, c/o Embassy, 2228 Massachusetts Ave. N.W., Wash., D. C., U.S.A., equipment for steel rolling mill with 20,000 ton yearly capacity.

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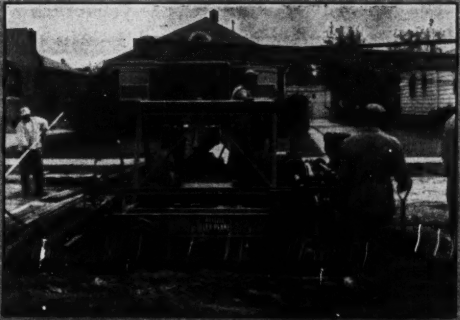
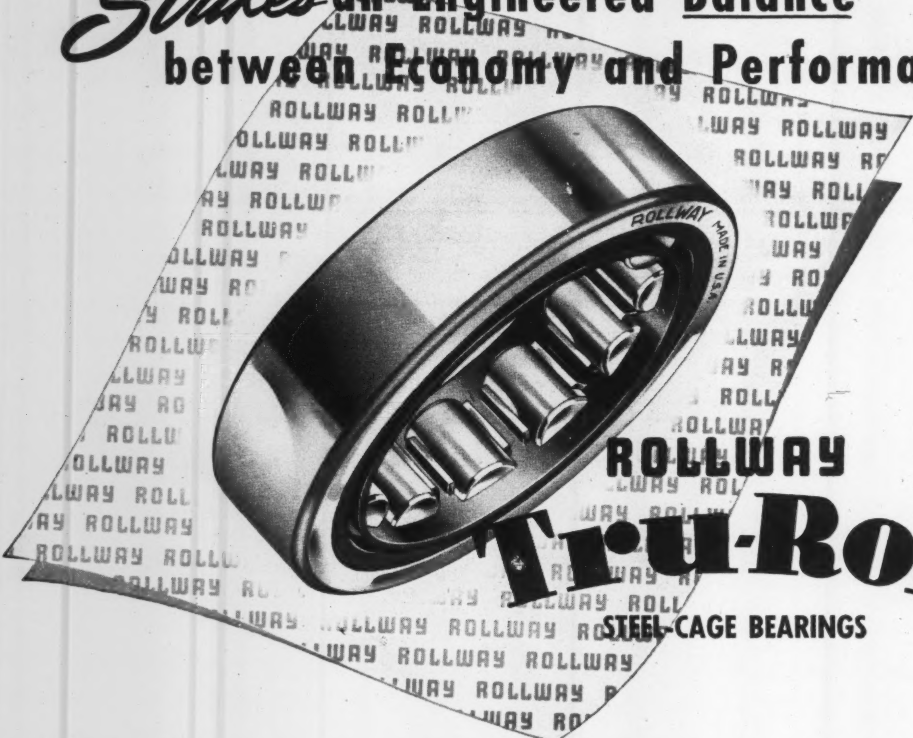
CONSTRUCTION EQUIPMENT

Note compact, low slung design. Transportation wheels are retracted. Heaviest masses of concrete are handled [illegible]



Ruggedly constructed, the Detroit Special has reversible screeds that [illegible] mounted outside the forms [illegible]

Strikes an Engineered Balance between Economy and Performance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That doesn't mean it is a "bargain" bearing. It isn't. Its low cost reflects: 1—ingenious steel-cage instead of bronze-separator construction; 2—years of know-how in cost-cutting methods; and 3—mass production by modern, high-speed, high-precision machinery and metallurgical facilities.

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ROLLWAY BEARINGS

ROLLWAY BEARING COMPANY, INC., SYRACUSE, N. Y.

Proposed Projects

WATER SUPPLY

▲ **Ala., Birmingham**—City, water supply dam on Warrior River, **$15,250,000.** J. W. Goodwin Eng. Co., 2111 7 Ave. S., consult. engr.

Calif., Daly City—City, City Hall, wells, pumping plant, reservoir lines. **$385,000.**

Calif., Fairfield—City, City Hall, city water filtration plant. **$678,227.** Solano Engineers Associated, Vallejo, consult. engrs. CD 4/18.

▲ **La., St. Bernard**—Water Dist. 1, St. Bernard Parish, Court House, Chalmette, voted **$3,000,000** bonds, water sys. CD 5/6.

▲ **Minn., St. Louis Park**—Village, J. Justad, plans by L. B. Abbett, 405 Wesley Temple Bldg., Minneapolis, water treatment plant. **$1,390,260.** G. M. Orr Eng. Co., 1004 Marquette Ave., Minneapolis, consult. engr. CD 1/26/50.

Tex., Houston—Harris County Water Control & Imprvt. Dist. 37 c/o Frank J. Metyko, 608 Scanlan Bldg., water mains, distr. lines, **$425,000;** water supply-storage, **$400,000,** near here.

▲ **Tex., Midland**—City, bond election Sept. 13, misc. items in general water imprv. program, not already named, **$1,330,000;** ground concrete storage reservoirs at Well Field, Alt. on 2 two m.g. each 35 ft. high, **$415,000;** pumping station, **$350,000;** elevated million gal. steel elevated storage tank, **$200,000;** 43,800 lin. ft. conduit or water supply line from field wells to city limits, **$1,400,000;** distr. and water gathering lines, **$650,000;** 10 water supply wells and completely equipping, **$400,000.** H. N. Roberts & Assoc., Lubbock, consult. engrs. Henry E. Nunn, water engr. CD 7/24.

Tex., Raymondville—City, voted bonds, well distr. lines, **$120,875;** elevated steel water tower and tank, **$55,000.** CD 7/16.

▲ **Tex., San Antonio**—City Water Bd., 106 W. Market St., lake and dam for water retention, **$12,500,000;** water conduit line to bring water from dam-lake to city limits, **$2,000,000;** pumping plant, **$1,000,000.** W. D. Masterson, c/o owner, engr.

Alaska, Fairbanks—City, City Hall, water treatment plant, **$250,000.** R. W. Beck & Assoc., 1118 Fourth Ave., Seattle 1, Wash., consult. engrs. CD 5/22.

SEWERS, WASTE DISPOSAL

Calif., Castro Valley—Castro Valley Sanitary Dist., 2040 Marshall St., **$950,000** bond election Oct. 14, sewers, appurtenances.

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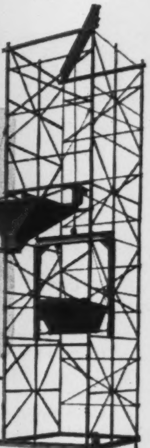

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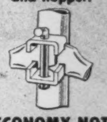

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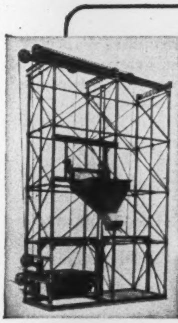

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Calif., Menlo Park—Menlo Park Sanitary Dist., Menlo Park, **$310,000** bond election Sept. 15 additional facilities to sewage disposal sys. CD 5/1.

▲ **Calif., South Laguna**—South Laguna Sanitary Dist., South Laguna, **$1,250,000** bond election Sept. 15, sewerage system development.

Colo., Denver—City and Denver Co., City and County Bldg., sanitary sewers, appurtenances in and for Sanitary Sewer District No. 316. **$197,440**. Terry Owens, city engr.

Kan., Lyons—City, voted **$275,000** bonds Aug. 8, sewage plant,

Mich., Mason—City council, Frank Dakin, Mason, sewage plant, sewers, treatment facilities incl. sanitary sewers, septic tanks, filter beds, McRoberts and Oak Sts. sect., south side. **$225,000**, Walter Zimmer, city engr.

Mich., Portland—Village, sewerage sys., incl. enlarging of river crossing, second river crossing, sewer exten., sewage treatment plant. **$200,000**. CD 12/9/47.

Mich., Saginaw—City, C. A. Miller, mgr., Williamson-Tausend trunk sewers section in Williamson from Thayer to river, **$695,000**, Hubbell, Roth & Clark, Inc., 2640 Buhl Bldg., Detroit, consult. engr. CD 10/11/48.

Miss., Vicksburg—City, sanitary sewer facilities for Westinghouse plant, **$150,000**, Bedell & Nelson, 840 Union St., New Orleans, La., consult. engrs. CD 9/1/50.

▲ **Mo., Kansas City**—City, c/o Reed McKinley, dir. Dpt. P. Wks., City Hall, Sewer Dist. 212, 9 to 12 Sts. and Jackson to Elmwood Sts., **$21,500**; Sewer Dist. 451, 7 to 12 Sts. and Ewing to Winchester Sts., **$42,000**; Sewer Dist. 636, 78 to 82 Sts. and Troost to Flora Sts., **$237,000**; Sewer Dist. 647, 77 to 79 Terrace and Main to Oak Sts., **$119,000**; Sewer Dist. 648, 80 to 83 Sts. and Grand to Oak Sts., **$93,000**; Sewer Dist. 651, 81 Terrace to 84 Terrace and Wornall Rd. to Walnut St., **$208,000**; Sewer Dist. 652, 79 to 81 Sts. and Pennsylvania to Walnut Sts., **$122,000**; Sewer Dist. 653, 77 to 79 Sts. and Warnall Rd. to Main St., **$123,000**; Sewer Dist. 654, 82 to 84 Sts. and Summit-Wornall Rd., **$76,800**; Sewer Dist. 655, 77 to 79 Sts. and Belleview to Washington Sts., **$126,000**; Sewer Dist. 656, 79 to 83 Sts. and Jarboe St., **$85,000**; Sewer Dist. 657, 84 to 85 Sts., and Wornall Rd. to Mercier Sts., **$105,000**; Joint Sewer Dist. 657 to 658, 83 to 85 Sts., along Wyoming St., **$17,000**; Sewer Dist. 658, 82 to 84 Sts. and state line to Summit St., **$130,000**; Sewer Dist. 659, 79 to 83 Sts. and Wyoming to Summit Sts., **$126,000**; Sewer Dist. 660, 79 to 82 Sts. and state line to Ward Parkway, **$47,000**. CD 8/12.

Tex., Canyon—City, voted bonds, sewage disposal plant, **$60,000**; sanitary sewer collective lines, **$60,000**.

(Continued on page 329)

MITCO
PRODUCTS
Hendrick Mitco Products Catalogue

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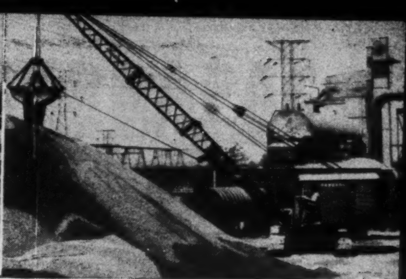

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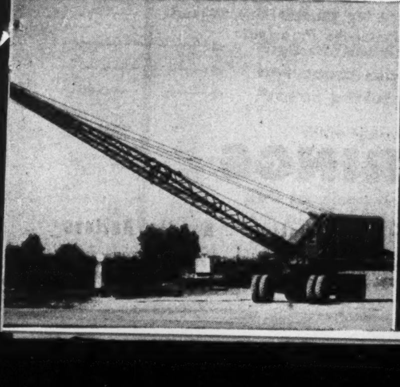

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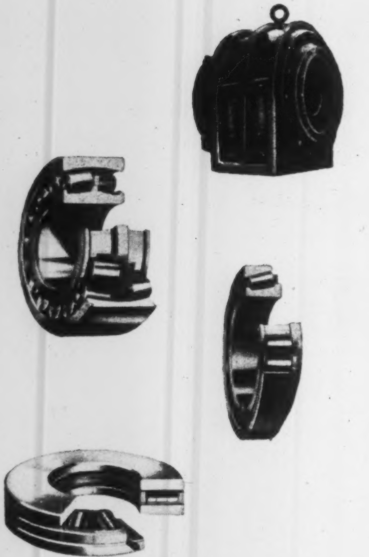

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(Continued from page 326)

Tex., Dallas—Caruth Foundation Sales Co., c/o W. W. Caruth, Jr., 5803 Greenville St., sanitary sewers, **$65,000**; storm sewers, **$60,000.**

Tex., Houston—City, City Hall, 900 Brazos St., Kashmere Gardens Storm Sewers, Sayers to Lockwood, Liberty Rd. to Huntington Bayou, **$360,000**; Moody Park Storm Sewers to run under Fulton, Cetti and Collingsworth Sts., **$127,000**; Dowling St. Storm Sewers under Elgin, Chartres and Ennis Sts., **$290,000.** Lockwood & Andrews, Union Natl. Bank Bldg., consult. engrs. CD 8/11.

Tex., Houston—Harris County Water Control & Imprvt. Dist. 37, c/o Frank J. Metyko, 608 Scanlan Bldg., sewage disposal plant, **$375,000**; sanitary sewer collection lines, **$350,000**, near here.

Tex., Houston—Harold L. Harrison, Real Estate, 1905 Chartres St., sanitary sewers, **$62,500**; storm sewers, open drainage, **$60,000**, on new Airline Dr., adjoining Wild Rose Gardens.

Tex., Houston—P. C. Stewart & Assoc., 5308 Carrolton St., sanitary sewers, **$110,000**; storm sewers, drainage, **$120,000**, Deer Park.

Tex., Midland—City, bond election Sept. 13, sewage disposal plant, **$400,000**; sanitary sewer lines and sys. imprvs. **$540,000.** CD 10/2/50.

Tex., Raymondville—City, voted bonds, sanitary sewer lines, **$134,125**; sewage disposal plant, **$90,000.** CD 7/16.

Tex., San Antonio—Roy Pletz, 1426 N. Brazos St., storm sewers, **$100,000**; sanitary sewers, **$100,000**, on a 500-homesite tract in area of Loma Park.

Tex., Shepherd—San Jacinto Water Control & Imprvt. Dist. 1, Shepherd and City of Shepherd, sewage disposal plant, **$165,000**; sanitary sewer collection lines, **$60,000.** M. D. St. John & Assoc., 6527 Findley St., Houston, consult. engrs.

BRIDGES

Calif., Long Beach—City, 205 E. Broadway, bridge and sewage pump station. **$150,000.** J. H. Davies, 730 E. 3 St., engr.

▲ **Mo., St. Louis** — City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 and Market Sts., Zone 3, rein.-con., steel viaduct to replace present ¼ mi. bridge on Fyler Ave. across River des Peres and Frisco Lines tracks. **$1,000,000.** CD 5/9/44.

NEW YORK AND CONNECTICUT—New York State Thruway Auth., 119 Washington Ave., Albany, 6, N. Y., 750 ft. bridge over Byram River near Fox Rd. Portchester, Westchester Co., N. Y. and Cliff Ave. Byram, Conn., **$2,600,000.** Robert W. Briggs, 271 North Ave., New Rochelle, N. Y., consult. engr.

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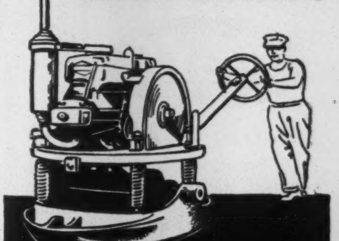

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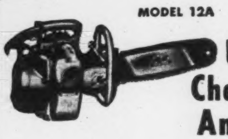

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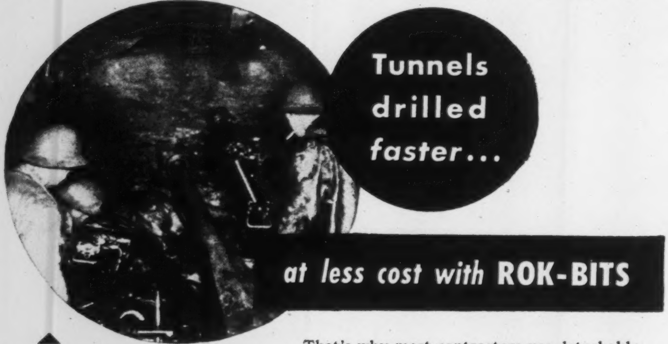
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at less cost with ROK-BITS

▲ Headings are here being drilled with carbide 4-point Rok-Bits. Roof bolting holes drilled with small RX Rok-Bits. Use them on your job! Write for "Guide to Better Footage, Lower Drilling Cost."

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STREETS AND ROADS

▲ **Mo., Kansas City**—City, c/o Reed McKinley, dir. Dpt. P. Wks., City Hall, Sixth Street Expressway sunken roadway from Fifth St. and Independence Ave. to Sixth St. trafficway from intercity viaduct to Holmes with overpass, cloverleafs, connecting links and bridges, **$2,700,000**, Howard, Needles, Tammen & Bergendoff, 910 Walnut St., Kansas City, Mo., consult. engrs., John E. Maring, city engr.; grading, paving and curbs on 20 locations, **$441,831**. CD 8/12.

NEVADA—State Hy. Dpt., State Office Bldg., Carson City,

Washoe Co.—constr. 2.6 mi. access road from Mt. Rose Hy. to Ski Bowl on Slide Mountain, **$250,000.** CD 6/11/43.

Tex., Bowie—City, 40 blocks permanent type street paving, concrete curbs and gutters, **$100,000.**

Tex., Houston—P. C. Stewart & Assoc., 5308 Carrolton St., street constr. and paving, Deer Park, **$125,000.**

Tex., Midland—City, bond election Sept. 13, street imprv. and paving, **$475,000**. CD 7/29.

▲ **Tex., San Antonio**—Bexar Co., c/o Comrs. Court, Court House, 4-lane 4½ mi. Military Access Rd. from Kelly-Lackland military areas to Culebra Ave. **$1,800,000**. W. White & C. I. Swan, county engrs. CD 10/2.

Tex., San Antonio—Roy Pletz, 1426 N. Brazos St., 2 boulevards and street constr., asph. paving, concrete curbs and gutters on 500-homesite tract in area of Loma Park, **$110,000.**

Alaska, Fairbanks—City, City Hall, paving, surf., lighting and drainage, **$397,600**. R. W. Beck & Assoc., 1118 Fourth Ave., Seattle 1, Wash., consult. engrs. CD 5/23.

EARTHWORK, WATERWAYS

▲† **California**—U. S. Eng., 130 Sutter St., San Francisco, Coyote dam on east fork of Russian River Est. **$17,000,000**, $100,000 federal allotment granted for preliminary planning. CD 4/14/44, under Reclamation.

▲ **California**—United Water Conservation Dist., 806 Railroad Ave., Santa Paula, Topa Topa Dam on Sespe Creek, **$9,000,000**; Santa Felicia Dam on Pirne Creek, **$7,000,000**. Julian Hinds, c/o owner, ch. engr.

▲ **Calif., Napa**—Napa Co., Court House, **$4,000,000** bond election Dec. 16. Putah Creek Dam and pipe lines.

▲ **Calif., Ventura**—Ventura Co., Court House, 193 ft. high dam to store 90,000 acre feet Casitas Dam and conduit, **$10,000,000**. Robert Ryan c/o owner, engr.

(Continued on page 333)

GETMAN'S NEW
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GOES THRU 32" DOOR
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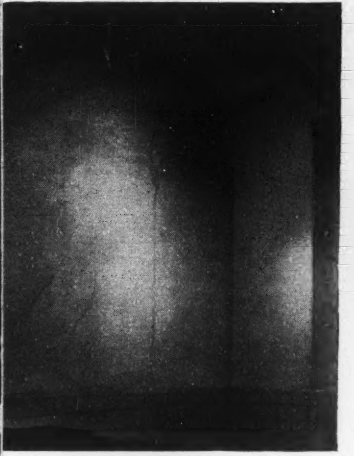
Federal Building, 312 N. Spring St. Los Angeles. (Photo taken after severe earthquake of July 21, 1952.)

Designed by—**Public Buildings Administration.**

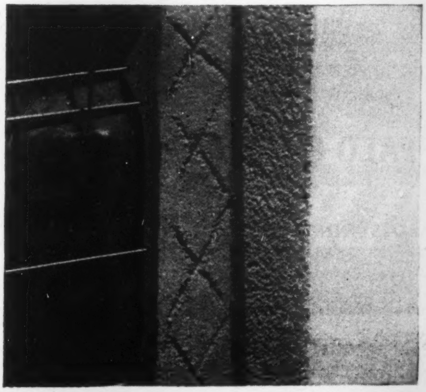
Constructed by—**Baruch Corporation and George A. Fuller Co.**

Plastering Contractor—**Jack Brown.**



This photo shows the maximum damage to plaster in Post Office workroom of Federal Building proving dependability of Steeltex Lath for reinforcing plaster walls and ceilings.

When plaster is applied to type A Steeltex Lath, it automatically forms a system of ribbed trusses giving exceptional strength and rigidity to the plaster similar to reinforced concrete.



Federal Building at Los Angeles Passes Test in Recent Earthquake

Only slight damage to plaster reinforced by Steeltex Lath proves soundness of original design

When the 22 story Los Angeles Federal Building was in the planning stage more than twenty years ago, the Public Buildings Administration of the U. S. Government, who designed the building, naturally wanted a structure that would withstand severe earthquakes. During the early planning stage in 1933 the disastrous Long Beach quake occurred. Facts gleaned from this severe quake caused the designers to revise their original plans, add 1500 tons of structural steel including Steeltex welded wire lath for better reinforcement of plaster ceilings and walls throughout the new building. The handsome building when completed in 1938 incorporated the most advanced ideas for resisting earthquakes.

At 4:52 A.M., July 21, 1952, California was shaken by a quake for about one minute, the most intense shock since the one in 1906 that demolished San Francisco.

How faithfully Steeltex Lath performed its reinforcing functions can best be understood by the photo at left and the comments of Mr. L. L. Thompson, Chief Engineer of the Federal Building who said, *"On the seventeenth floor the building movement was so violent that file cabinet drawers flew open and many cabinets toppled over. Yet, the only plaster cracks in the building, other than structural shear cracks, occurred where Steeltex Lath and plaster joined concrete beams. Compared with plaster damage in other buildings in this vicinity, our damage was slight, indeed."*

In comparison an estimated $100,000 damage occurred in one building in the Los Angeles area.

Get the complete story on Steeltex. There is a type for plaster, stucco, masonry veneer, roofs and floors. See Sweet's or write for Catalog D.S. 130, Dept. ENR, Pittsburgh Steel Products Company, Grant Bldg., Pittsburgh 30, Pa.

Pittsburgh Steel Products Company

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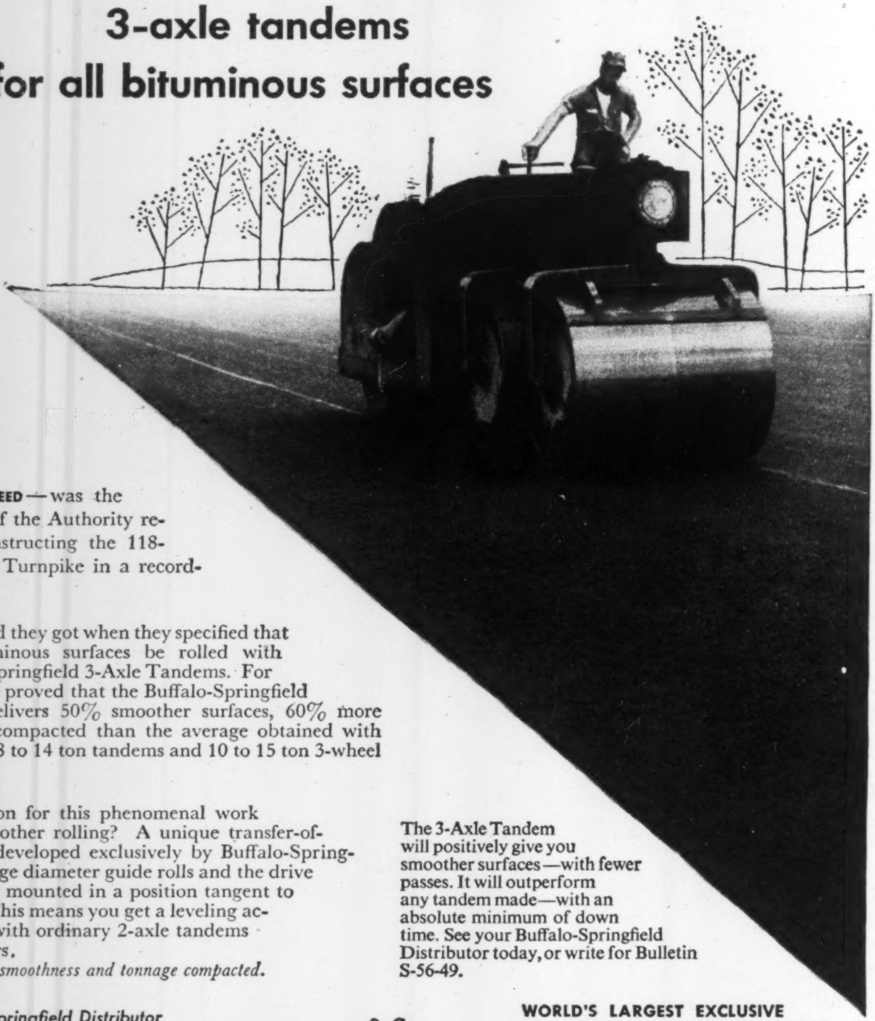

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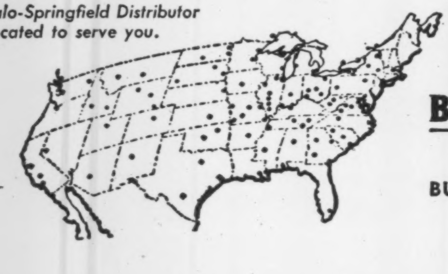

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(Continued from page 330)

Tex., Harlingen—Arroyo Colorado Navigation Dist., Harlingen, bond election Sept. 13, unloading adjustable ramp, **$60,000**; railway lines, **$120,000**; water sys. **$50,000**; excavation and leveling of grounds, **$50,000**; grounds preparation, grading, drainage, leveling, retaining walls for Spoil area, **$60,000**; service road, drainage structures, storm sewers, **$63,000**. CD 4/26/46.

▲ **Tex., Houston**—Harris Co., Court House, Poor Farm ditch drainage either rein.-con. lined, concrete bottom lined, pile driven walls, or concrete box culverts, **$464,023 - $2,340,051**. Howard, Jensen, Scanlan Bldg., flood control engr. CD 1/26/51.

AIRPORTS

† **Ala., Maxwell Air Force Base**—ACADEMIC, etc.—U. S. Eng., P. O. Box 1169, Mobile, 7, Ala., plans by Warren, Knight & Davis, Protective Life Bldg., Birmingham, academic bldgs. and research bldgs. **$300,000**.

▲ **Calif., Palmdale**—SERVICE CENTER—North American Aviation, Inc., 5601 W. Imperial Hy., Inglewood plans by Parkinson, Powelson, Briney, Bernard & Woodford 410 N. La Brea St., Los Angeles, aircraft service center at Palmdale Airport, **$3,000,000**.

† **Tex., Dallas**—LABORATORY—Dpt. Navy, 8th Naval Dist., New Orleans, La., aircraft structural testing laboratory, adjoining Chance Vought Plant at Hensley Field. Approx. **$750,000**.

Tex., Sherman—AIRPORT—City, airport. **$180,000**. Freese & Nichols, 407 Danciger Bldg., Fort Worth, consult. engrs. CD 6/25.

Wash., Yakima—AIRPORT EXTEN.—City, City Hall, bond election scheduled for Sept. 9 postponed until next spring, airport extension, **$200,000**. A. B. Collins, city engr. CD 7/15.

LATIN AMERICA

▲ **Mexico, Vera Cruz**—Gulf Sulphur de Mexico (Pan American Sulphur Co. Parent Owner) Vera Cruz, plans 500,000 ton annually sulphur mining plant, near here. **$3,664,000**.

FOREIGN

▲ **Africa, Southern Rhodesia**—Electrical Supply Commission, Salisbury, 30 m. g. Vrede Dam, **$1,960,000** and 1,750,000 gal. Dutchmen's Pool Dam on Sebakwe River with connecting canal, near Gwelo.

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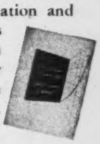

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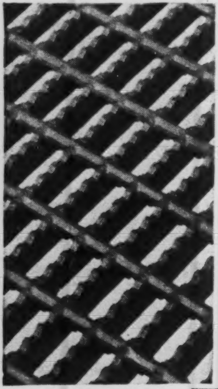

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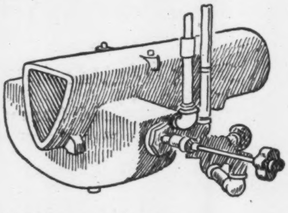

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PUBLIC BUILDINGS

Ala., Tuscaloosa—SPEECH, MUSIC—University of Alabama plans by Van Keuren, Davis & Co., 3004 7 Ave. S., Birmingham, speech and music bldg. **$450,000.**

▲ **Calif., Centerville**—HOSPITAL—Washington Township Community Hospital Dist., Centerville, **$1,000,000** bond election Nov. 4, hospital, near here. Sorensen & Ellsworth, P.O. Box 95, Niles, archts.

▲† **Calif., San Diego**—HOSPITAL—Dpt. Navy, San Diego, plans by Welton Becket & Assoc., 5657 Wilshire Blvd., Los Angeles, 1,000 bed Naval Hospital addn., **$7,273,000.**

▲ **Calif., San Diego**—SCHOOL—San Diego Unified School Dist., plans by Clyde Hufbauer, 18751 5 Ave. 16 one story, frame, stucco Pacific Beach High School Buildings, **$1,000,000.**

▲ **Calif., San Mateo**—HOSPITAL—San Mateo Co., Court House, Redwood City, **$1,900,000** bond election Nov. 4, hospital wing at Community Hospital.

Calif., San Mateo—JUVENILE HALL—San Mateo Co., Court House, **$400,000** bond election Nov. 4. Hillcrest Juvenile Hall.

▲ **Colo., Grand Junction, Fruita and Fruitvale**—SCHOOLS—School District 51, Mesa County, Grand Junction, high school, Grand Junction; Junior High School at Fruita, grade school at Fruitvale, grade school addn., Grand Junction, **$3,048,000.** Atchison & Kloverstrom, 1254 Monaco Parkway, Denver, consult. engrs. and archts. CD 3/31/46.

Colo. ,Pueblo—SCHOOL—School Dist. 70, Pueblo County, Pueblo, 2 story high school in East Pueblo, **$578,592.** Alfred Watts Grant, 306 Flatiron Bldg., Denver, consult. engr. and archt. CD 10/23/50.

Ga., Marietta—HOSPITAL—City and Cobb Co., plans by Bothwell & Nash, 208 Roswell St., Kennestone Memorial Hospital addn. **$500,000.**

Ill., Orland Park—SCHOOL—School Dist. 230, Orland Park, plans by Ganster & Henninghausen, 222 W. Washington St., Waukegan, high school. **$750,000.**

▲† **Ind., Charlestown**—PLANT, etc.—U. S. Eng., 830 W. Broadway, Louisville 1, Ky., rebuilding plant, roads, railroad tracks, utility lines, supporting facilities, **$1,300,000;** 2 warehouses, completion of 24 above ground magazines at Hoosier Ordnance Plant. **$1,600,000.**

▲ **Ia., Cedar Rapids**—SCHOOLS—Bd. Educ., Cedar Rapids 2 Senior High Schools, **$7,500,000.** **CD** 3/17/48.

La., New Orleans—SCHOOL—Orleans Parish School Bd., 703 Carondelet St., plans by Favrot, Reed, Mathes & Bergman, Nola Bldg., Shakespeare Park Negro Junior High School, **$500,000.**

(Continued on page 337)

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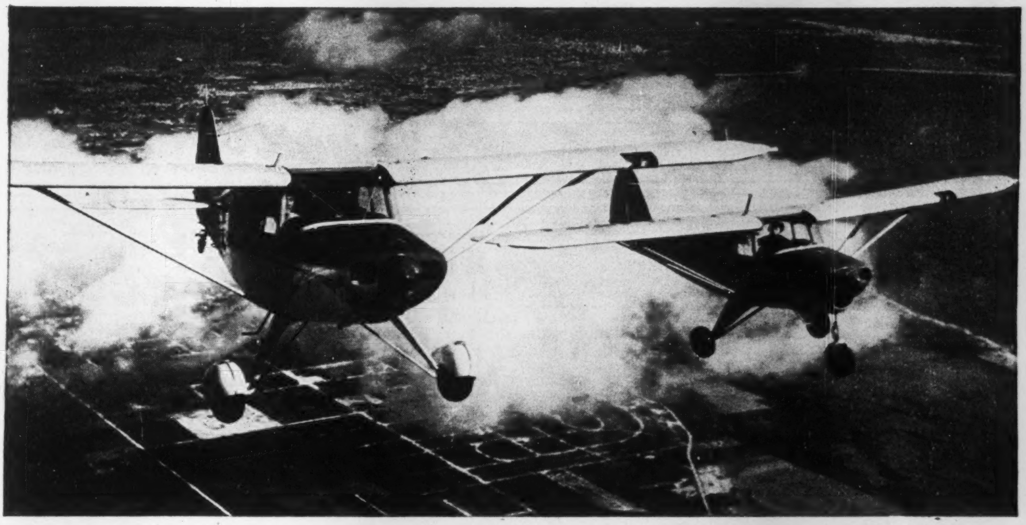

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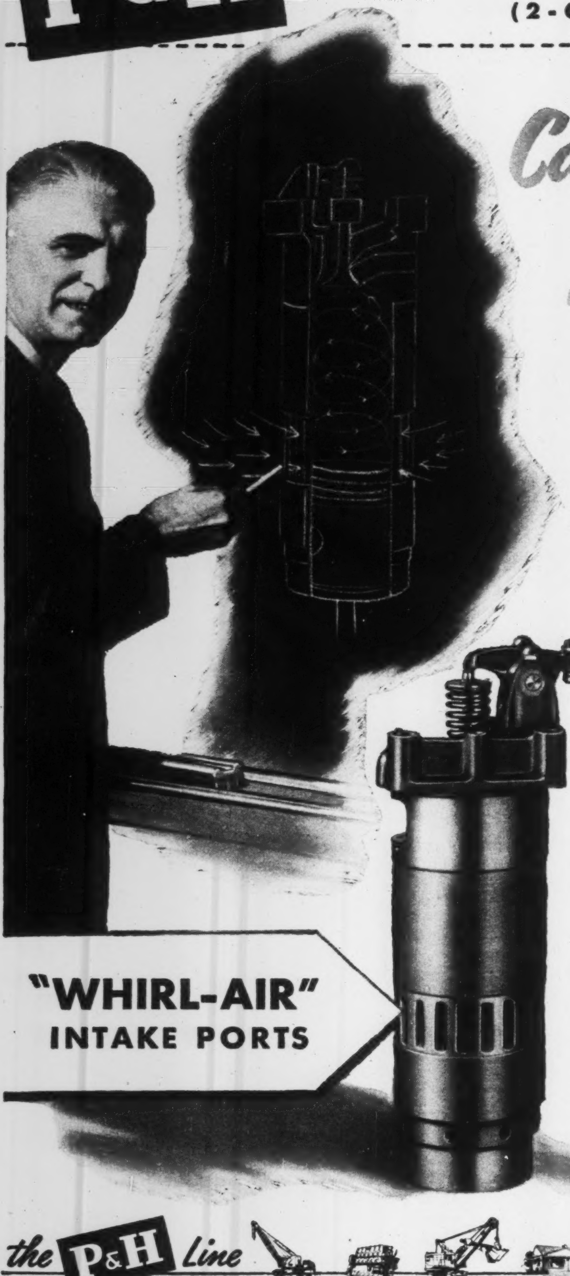
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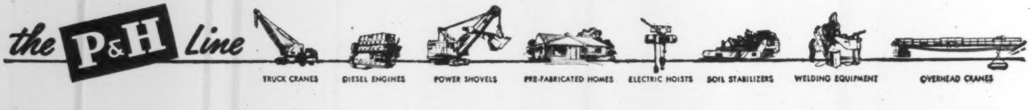
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(Continued from page 334)

La., Vinton—HOUSING—Vinton Housing Auth., Vinton, plans by Matkin & Fitch, 4101 San Jacinto St., Houston, Tex., 40 housing units, **$400,000.**

▲ **Md., Annapolis**—HOSPITAL—Anne Arundel General Hospital, Annapolis, plans by Jas. R. Edmunds, Jr., 103 W. Hamilton St., Baltimore, 4 story, brick, rein.-con., steel Baldwin Wing hospital addn. **$1,000,000.** Jas. Posey, 10 E. Pleasant St., Baltimore, mech. engr., Alex. E. Forrest, 514 Park Ave., Baltimore, struct. engr.

† **Md., Fort Geo. G. Meade**—COMMUNICATIONS and RELAY, etc.—U. S. Eng., 24 St. and Maryland Ave., Baltimore, Zone 18, plans by J. L. Faisant & Assoc., engrs. and archts., 21 W. 25 St., Baltimore, 28,500 sq. ft. masonry communications and relay bldg., roads, outside utilities. **$900,000.** CD 5/16/51.

▲ **Mass., Woburn**—HOUSING—Woburn Housing Auth., Albert F. Curran, 11 Winn St., plans by Perley F. Gilbert Assoc., 53 Central St., Lowell, 100 duplex housing units. **$1,200,000.**

Mich., Birmingham—SCHOOLS—City, Bd. Educ., brick, steel Torry Elementary School addn., **$400,000.**

▲ **Mich., Detroit**—SCHOOLS—City, Bd. Educ., 1354 Broadway, plans by Malcomson, Fowler & Hammond, 1217 Griswold St. (first unit), brick, steel, concrete George Washington Carver Elementary School, **$700,000;** plans by Edward A. Schilling, Inc., 728 Michigan Bldg., 2 story, bsmnt., brick, steel, concrete, Hubert Elementary School, Lamphre Rd., **$400,000.**

Minn., Austin—SCHOOL—Bd. Educ., Independent School Dist. 27, S. L. Coumbe, clk., plans by Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, 1 story, bsmnt., 170x280 ft. school, **$600,000.** CD 12/20/51.

† **Minn., Minneapolis**—SHOP, etc.—U. S. Eng., 1709 Jackson St., Omaha, Neb., shop, railroad siding, utilities, rehabilitation of bldgs., Twin Cities Arsenal, **$778,200.**

▲ **Minn., St. Paul**—SCHOOL—Bd. Educ., F. E. Conner, supt., R. Hammell, bd. archt., 615 City Hall, plans by Ellerbe & Co., E. 505 First National Bank Bldg., East Side Junior High School, White Bear and Maryland Aves. **$1,500,000.** CD 10/30/50.

Miss., University—SCIENCE ENGINEERING—University of Mississippi, University, plans by R. W. Naef, Masonic Bldg., Jackson, science-engineering bldg. **$500,000.**

Neb., Lincoln—POWER PLANT—City, City Hall, power plant expansion, **$600,000.** D. L. Erickson, city engr.

▲ † **N. J., Fort Dix**—BACHELOR OFFICERS QUARTERS—Dpt. Army, 121 N. Broad St., Phila., Pa., plans by Fridy, Gauker, Truscott & Fridy, 1321 Arch St., Phila., Pa., 10 bachelor officers quarters, **$1,000,000;** 31 barracks, 7 mess bldgs., **$5,000,000;** plans by

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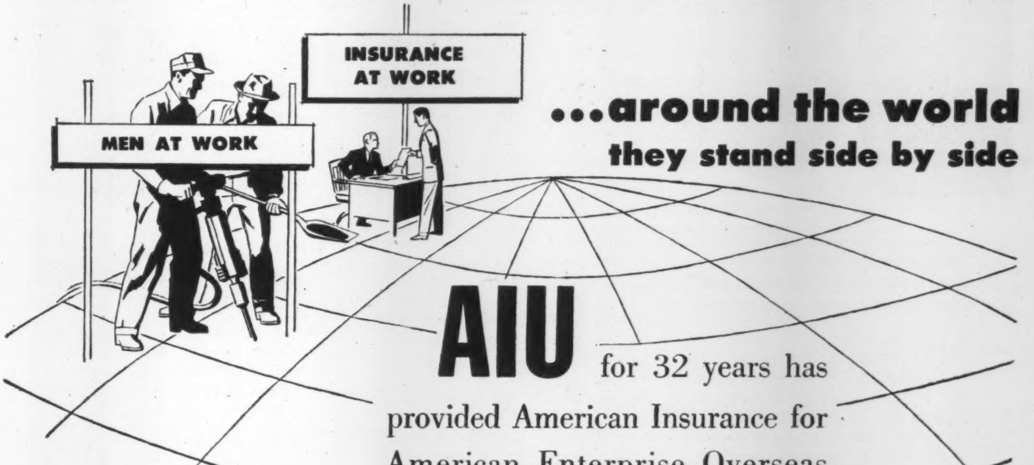

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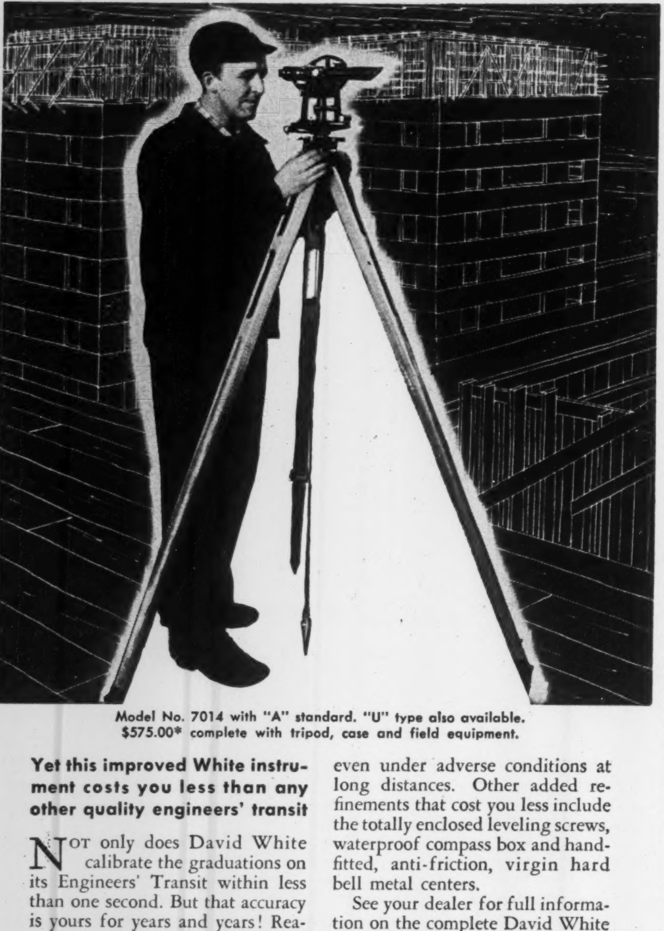

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Erwin Gerber, Commerce Bldg., Newark, base communications center bldg., guard house, officers mess bldg., inflammable storage bldg., **$3,000,000;** plans by American Hydrotherm & Adache & Case, 33-70 12 St., Long Island City, N. Y., heating plant and distribution system, **$1,000,000.**

▲ **N. Y., Arverne**—HIGH SCHOOL—Bd. Educ., 49 Flatbush Ave. Exten., Brooklyn, Zone 1, plans by Keally & Patterson, 17 E. 49 St., New York, Zone 17, 4 story Junior High School, 198 Beach 56 St. between Beach Channel Dr. and Arverne Blvd., Proj. E-734. **$2,683,000.**

▲ **N. Y., New York**—SCHOOL—Bd. Educ., 49 Flatbush Ave. Exten., Brooklyn, Zone 1, Proj. E-93, New York School of Printing, on block bounded by 49 St., 59 St., Ninth and Tenth Aves. **$6,900,000.** CD 8/23/45.

† **O., Piketon**—PLANT—U. S. Atomic Energy Comn., 1901 Constitution Ave. N. W., Wash. 25, D. C., selected A. M. Kinney, Inc., 2905 Vernon Ave., Cincinnati, O., for engineer-architect services for site preparation, and installing utilities, incl. grading, sanitary sewers, water supply, electrical, fire alarm and communication systems, roads at Atomic Project. CD 8/13, under CA.

▲ **Tex., Abilene**—HIGH SCHOOL—Abilene Independent School Dist., Abilene, plans by David S. Castle Co., 1082½ N. 1st St., high school. **$2,000,000.**

▲ **Tex., Corpus Christi**—HIGH SCHOOL—Corpus Christi Independent School Dist., 515 N. Carancahua St., plans by Smyth & Smyth, 1806 S. Alameda St., Junior High School. Tex 41-P-1053. **$1,004,232.** CD 5/3/51.

Tex., Kenedy—HOUSING—Kenedy City Housing Auth., Kenedy, plans by Helland & Seligmann, 302 Frost Bank Bldg., San Antonio, 100 housing units. **$750,000.** CD 5/6.

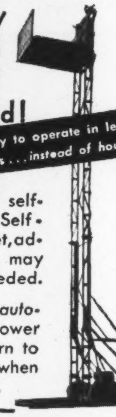
Tex., Midland—JAIL and FIRE STATION—City, bond election Sept. 13, jail and central fire station, **$423,867.** CD 8/6.

Tex., San Antonio—SCHOOLS—San Antonio Independent School Dist., Lavaca and Matagorda Sts., plans by Atlee B and Rob. M. Ayres, Transit Tower, Rhodes Junior High School, **$700,000;** plans by Ralph H. Cameron, 1701 Transit Tower, Elmer A. Neal Elementary School, **$325,000.** Phelps & DeWees & Simmons, 1506 Major Bldg., supervising archts. on both projects. CD 8/22/51.

▲ † **Va., Little Creek**—SCHOOL, etc.—P. Wks. Office, Fifth Naval Dist., U.S. Naval Base, Norfolk, school and training bldgs. and land acquisition at Little Creek Amphibious Base, **$2,325,000.**

Va., Norfolk—SCHOOL—Norfolk County School Bd., 148 Granby St., plans by Walford & Wright, 103 Cary St., Richmond, 1 story, brick, concrete, masonry high school, Great Bridge. **$950,000.**

(Continued on page 341)



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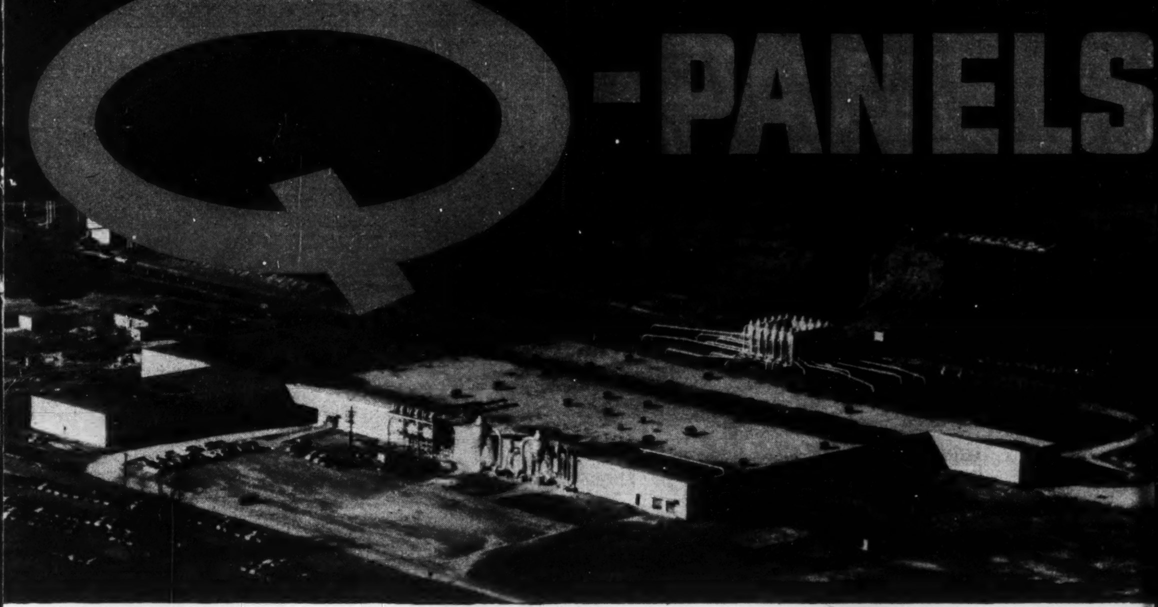
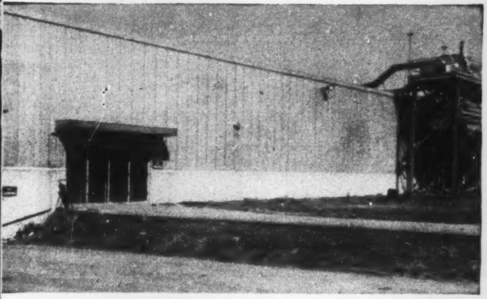


Air view of the FORMICA COMPANY'S building. Walls of Q-Panel were detached, moved forward and used again on the addition. A Q-Panel wall has the quality of a permanent wall but with the additional advantage of being removable to provide for plant expansion.



Close-up of the FORMICA plant shows the neat and attractive design formed by continuous Q-Panel fluted texture. Architects have achieved a great variety of design by combining Q-Panels with other materials for decorative effect.

From left to right—Mr. D. J. O'Conor, President of the FORMICA COMPANY, Mr. A. M. Kinney, President of A. M. Kinney, Inc., which designed the FORMICA plant and Mr. George H. Clark, Vice President in charge of engineering of the FORMICA COMPANY.

The FORMICA COMPANY built its new Cincinnati plant with Q-Panel walls, later removed the Q-Panels from two sides and re-used them on the addition. Note, in the air view, the older section has a lighter colored roof than the newer section.

ROBERTSON Q-PANELS can be taken down as easily as they can be erected—which is about nine minutes for a fifty-square-foot unit by a crew of only four men. Q-Panels provide you a good-looking wall, with erection and maintenance features that solve the peculiar construction problems which have arisen in the last ten years.

Q-Panels lend themselves to a great variety of designs. They are available in several fluted patterns. They require no maintenance, arrive at the site ready for erection either as a factory-assembled panel or a field-assembled panel. Do you have the details in your file?

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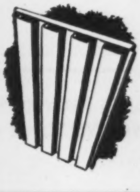

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Highland Park, in New Jersey's booming Middlesex County, is rapidly expanding as defense workers move in to man a score of new plants in the area. Industrial employment in the county has jumped 127% in the last decade — 10% in the last year — and more than 60% of the area's plants are engaged in defense production.

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Bakersfield, Calif. (Air Force Base)	196,000 ft.
Marion, N. C. (Municipal Expansion)	32,000 ft.
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Panama City, Fla. (Municipal Expansion)	450,000 ft.
Rantoul, Ill. (Chanute Field)	158,000 ft.

Vitrified
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CLAY PIPE NEVER WEARS OUT!
PIPE

C-252-4

(Continued from page 338)

▲ † **Va., Norfolk**—FACILITY—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, deperming facility at Naval Degaussing Station. **$2,000,000.**

▲ † **Va., Norfolk**—HOSPITAL—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, plans by Hayes, Seay, Mattern & Mattern, 609 S. Jefferson St., Roanoke, and Skidmore, Owings & Merrill, 575 Madison Ave., New York 22, N. Y., archts-engrs., Naval Hospital. **$12,815,000.** CD 4/4.

† **Va., Norfolk**—TROOP HOUSING—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, troop housing at Naval Supply Center, Cheatham Annex, **$564,000.**

† **Va., Yorktown**—BARRACKS—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, barracks at Naval Mine Depot. **$500,000.**

Wash., Spokane—SCHOOL—School Bd., Spokane, Vera Elementary School. **$425,000.**

COMMERCIAL BUILDINGS

▲ **Ariz., Phoenix**—DWELLINGS, etc.—L. B. Holaday, Dean Hawn & John B. Mills, Mercantile Securities Bldg., Dallas, Tex., 600-dwelling project, **$5,250,000**; 7-acre area shopping center, on 160 acre tract, **$550,000.**

Calif., Alhambra—OFFICE—Pacific Telephone & Telegraph Co., 740 S. Olive St., Los Angeles, plans by Allison & Rible, 625 S. Westmoreland Ave., Los Angeles, 1 story, rein.-con. office bldg. **$500,000.**

▲ **Calif., El Centro**—DWELLINGS—Mrs. Pearl Sherman, c/o Victor Neuman, 627 Wensly, El Centro, 168 dwellings between 8 and 12 Sts. **$1,250,000.**

▲ **D. C., Wash.**—HOMES—S & S Building Corp., 2424 59 Pl. Cheverly, Md., 1500 semi-detached and detached homes, plus some apartment units, Branch Ave. and St. Barnabas Rd. S. E., Marlow Heights. **$18,000,000.**

Ia., Council Bluffs—HOSPITAL—Jennie Edmundson Hospital, Oak and Pierce Sts., plans by G. B. Larson, 305 W. Broadway, hospital addn. **$400,000.**

▲ **Mass., Peabody and Lynnfield**—SHOPPING CENTER—The Old Colony Investment Trust Co., Swampscott, shopping center, Auto Rte. 128, Town Line. **$4,500,000.**

N. H., Wolfboro—MEMORIAL—Brewster Free Academy, V. D. Rogers, pres., Wolfboro, plans by Goodspeed Newell, 20 Pleasant St., Concord, 1 and 2 story memorial bldg. **$400,000.** CD 12/5/51.

▲ **N. Y., Bay Shore**—SHOPPING CENTER—Robert D. L. Gardiner, c/o Ketchum, Gina & Sharp, archts., 227 E. 44 St., New York, N. Y., shopping center, incl. 2 story department store, supermarket. **$1,000,000.**

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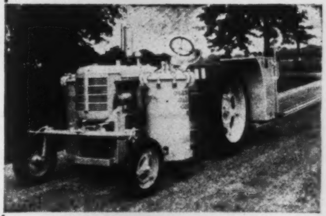

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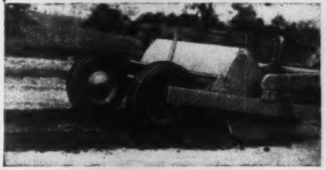

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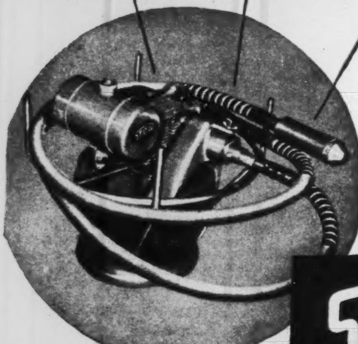

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N. Y., **Brooklyn**—APARTMENT—Renault Constr. Corp., 173 80th St., Zone 9, plans by Kitzler & Nurick, 66 Court St., Zone 2, 6 story apartment, 359-71 Ovington Ave. **$700,000.**

N. Y. **Brooklyn**—BUILDING—Young Men's and Young Women's Hebrew Assn., 645 Sheffield Ave., Zone 7, plans by William I. Hohauser, 151 W. 51 St., New York, Zone 19, 2 story, Y.M. and Y.W.H.A. Bldg., 2057-76 Linden Blvd. **$400,000.**

N. Y., **Jackson Heights**—APARTMENTS—J. Friedland, c/o Julius Fishkind, archt., 161-19 Jamaica Ave., Jamaica, 6 story apartment 85 St. and 34 Ave. **$300,000;** 6 story apartment, 37 Ave. between 87 and 88 Sts. **$500,000.** CD 10/4/51.

▲ N. Y., **Kew Gardens**—APARTMENTS—Second Housing Corp., c/o Benjamin Braunstein, archt., 163-18 Jamaica Ave., Jamaica, five 6 story apartments, Jewel Ave. and 164 St., **$1,775,000;** 6 story apartment, Jewel Ave. and 161 St., **$355,000;** two 6 story apartments, Jewel Ave. and 162 Sts., **$710,000.**

▲ N. Y., **New York**—APARTMENT—Court Square Building, Inc., 575 Madison Ave., Zone 22, project abandoned, convert 18 story apartment at 300 Park Ave. into office bldg. **$5,000,000.** CD 5/16/51.

▲ N. Y., **New York**—OFFICE—Charles & Milton A. Kimmelman, 745 Fifth Ave., Zone 22, plans by Emery Roth & Sons, 18 E. 48 St., Zone 17, 18 story office, Fifth Ave., and 46 St. to be called 555 Fifth Ave. **$3,000,000.**

▲ N. Y., **New York**—APARTMENT—Riverlawn Realty Corp., 1391 Grand Concourse, Zone 52 plans by S. J. Kessler, 118 E. 28 St., Zone 16, 13 story apartment, Webster Ave and 236 St. **$1,224,000.**

▲ N. Y., **New York**—OFFICE—Uris Bros., 575 Madison Ave., Zone 22, plans by Emery Roth & Sons, 18 E. 48 St., Zone 17, 25 story office, 300 Park Ave. **$9,000,000.**

▲ O., **Cincinnati**—DWELLINGS—Carl Hunsicker, 4438 Appleton St., will not construct 60 one-family bsmnt., brick dwellings, Compton Rd., east of Winton Rd. **$1,500,000.** Project Abandoned. CD 4/10.

Okla., **Bartlesville**—HOUSING—Phillips Petroleum Co., Bartlesville, plans by A. D. Lynn, 514 E. 4 St., 80 building site housing development. **$800,000.**

Okla., **Broken Arrow**—HOUSING—H. G. Hayes, Broken Arrow, plans by Donald McCormick, 1124 S. Boston St., Tulsa, 60 unit housing development. **$500,000.**

▲ Okla., **Oklahoma City**—HOUSING—Charles Stanford, Inc., 609 N.W. 23 St., housing development for colored, N.E. 10 and Bryant Sts. **$1,800,000.** Phillips & Stong, 2832 Wilshire St., consult. engrs.

Pa., **Levittown**—STORE—Sears Roebuck & Co., 4640 Roosevelt Blvd., Phila., department store. Approx. **$500,000.**

(Continued on page 345)

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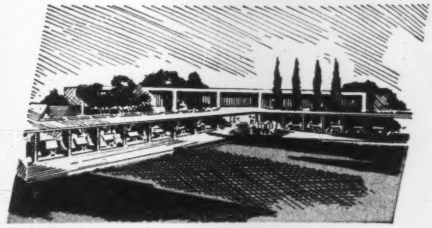

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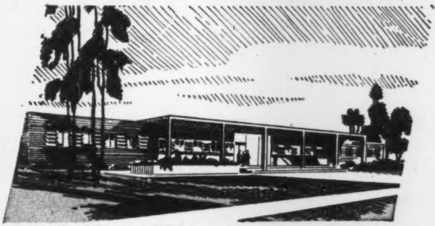

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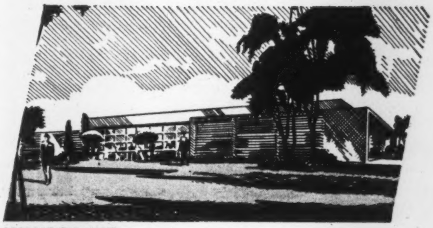

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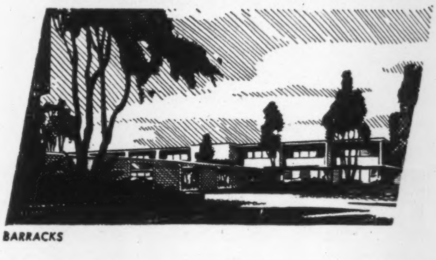

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(Continued from page 342)

▲ **Pa., Pittsburgh**—OFFICE and SERVICE—Remington Rand, Inc., 4 and 23 Aves., New York, N. Y. plans by Harry O. Bartlett, 232 E. Erie St., Chicago, Ill., 6 story, 79x190 ft., brick, tile office and service bldg. **$1,300,000.** CD 7/19/51.

Tex., Abilene—HOTEL—Elbert Hall, Jack Hughes & J. D. Perry, Jr., Abilene, plans by Charles Stevens Dilbeck, 3113 McKinney St., Dallas, and Carlos B. Schoeppl, 2701 Biscayne Blvd., Miami, Fla., 1 story, brick, stone "Four Winds" activity Center Hotel. **$750,000.**

▲ **Tex., Houston**—DWELLINGS—Berkshire Village Corp., 702 Mulberry Lane, Group 1, 50 dwellings, **$400,000;** Group 2, 60 dwellings, **$450,000;** Group 3, 75 dwellings, **$590,000;** Group 4, 48 dwellings, **$375,000;** Group 5, 85 dwellings, **$650,000;** Group 5, dwellings, **$490,000** in 2nd area off LaPorte Rd., near here.

▲ **Tex., Houston**—BANK, OFFICE, GARAGE—Second National Bank of Houston, 800 Main St., plans by Kenneth Franzheim, 2402 Crawford St., 25 story bank and office. Approx. **$4,000,000;** 100x150 ft., parking garage, Milam and McKinney, **$500,000.** CD 6/19.

▲ **Tex., Kingsville**—HOUSING—U. S. Govt., Officer in Charge of Construction, 8th Naval Dist., Bldg. 16, Naval Air Station, New Orleans, La., plans by Milam & Roper, 368 Casa Linda Plaza, Dallas, construct, manage and finance; 233 housing units for enlisted men. **$1,747,500;** 64 housing units for officers, **$512,000.** CD 1/29.

▲ **Tex., Midland**—DWELLINGS—Blue Ribbon Homes, Midland, Group 1, 50 frame dwellings, concrete fdn., **$337,500;** Group 2, 51 frame dwellings, concrete fdn., **$344,250;** Group 3, 50 frame dwellings, concrete slab fdn. **$348,000,** all foregoing in Permian Estates area.

Tex., Rockdale—DWELLINGS—H. H. Coffield & Fritz Hunter, Rockdale, 60 dwellings (30 duplexes) **$445,000;** 40 dwellings, **$300,000.** Peabody Engineering Corp., Gulf Bldg., Houston, engrs-designers. CD 8/15.

▲ **Tex., San Antonio**—DWELLINGS—Ray A. Conway, 535 E. Mayfield Blvd., 35 dwellings, concrete slab fdn. **$300,000;** 45 frame dwellings, concrete pier fdn., **$350,000;** 59 frame dwellings, concrete slab fdn., **$375,000,** in new area of Bellaire off Pleasanton Rd.

Tex., San Antonio—DWELLINGS—Ire L. Rupley & Tom Lively, 4911 Greenville St., Dallas, 35 dwellings, **$300,000;** 40 dwellings, **$325,000,** both in Crestwood Heights.

▲ **Ont., Sarnia**—HOUSING—A. M. Greenaway & Co., 169 Yonge St., Toronto, 100 rental units as multi-dwellings and 250 to 300 homes in Blue Water Section. **$3,500,000.**

Ont., Toronto—OFFICE—Crown Development Co., 1454 A Yonge St., plans by Page & Steele, 72 St. Clair

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ROT
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New Jersey highway bridge of wood costs the county 2/3 less . . .

• The 300-foot bridge over Deal Lake in Monmouth County, New Jersey was built in 1941 of treated wood for two reasons: (1) the treated timber structure costs less than a third of what a similar concrete bridge would cost, and (2) the treated lumber resists rot, rust, corrosion and termites. This bridge has now given 11 years of maintenance-free service.

Composite deck construction was chosen for durability and economy. Wolmanized* lumber is a natural in composite construction where direct contact is made between the nail laminated wooden deck and the bituminous concrete roadway surface.

Wolmanized lumber is clean, odorless, paintable, non-leaching. Hundreds of millions of feet of it have been used and have given decades of satisfactory service. The ability of Wolman preservative salts to prevent decay or insect attack makes any lumber last longer in the presence of moisture and termites. There are Wolman preservative treatment plants in all parts of the country. Our representatives will be glad to discuss specific applications. For further information, write:

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see our CATALOG in SWEET'S FILE ARCHITECTURAL

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*Reg. U. S. Pat. Off.

Before you plan Foundations

INVESTIGATE

Vibroflotation

Soil Compaction

for

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Earth Dams • Levees
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Concrete Dams

Increases load-bearing capacity • reduces costs

Before you plan foundations, find out if Vibroflotation is adaptable to your project. This modern process of granular soil compaction provides high bearing capacity at *substantial savings* . . . eliminates need for, or increases efficiency of piling and extensive spread-footings . . . solves problems of settlement under vibratory loads.

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RUST

Write for Bulletin . . .
Important facts for engineers about Vibroflotation.

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Ont., Toronto—OFFICE—Harry Merker, 324 Richmond St., W., 6 to 7 story, office, University Ave. and King St. W. **$500,000.**

INDUSTRIAL BUILDINGS

▲ **Calif., El Segundo**—CRACKING UNIT—Standard Oil of California, 225 Bush St., San Francisco, 36,000 bbl. daily capacity catalytic cracking unit, **$20,000,000.** CD 10/2/45.

▲ **Calif., La Habra**—INDUSTRIAL PLANT—Beckman Instruments, Inc., 820 Mission St., South Pasadena, industrial plant bldgs. for scientific instruments, **$2,000,000.** Donald R. Warren Co., 3109 Wilshire Blvd., Los Angeles, consult. engrs. CD 2/27.

▲ **Calif., Los Angeles**—FACTORY—Heller Co., 2135 Superior St., Cleveland, O., factory. **$1,000,000.**

▲ **Calif., Palmdale**—ASSEMBLY—Lockheed Aircraft Corp., 2555 N. Hollywood Way, Burbank, plans by Parkinson, Powelson, Briney, Bernard Woodford, 410 N. LaBrea Ave., Los Angeles, 180x800 ft. assembly bldg. 120x160 ft. maintenance bldg., at Palmdale Airport **$5,000,000.** CD 9/14/51.

▲ **Calif , San Fernando**—BREWERY—Anheuser-Busch, Inc, 721 Pestalozzi St., St. Louis, 18, Mo., brewery. **$45,000,000** (first unit $15,000,000) Holmes & Narver Inc., 828 S. Figueroa St., Los Angeles, consult. engr. CD 8/6, under Calif., Los Angeles,

▲ **Calif., Van Nuys**—BREWERY—Joseph I. Schlitz Brewing Co., 235 W. Galena St., Milwaukee, Wis., plans by Harley, Ellington & Day, 153 E. Elizabeth St., Detroit, Mich., brewery. **$20,000,000.** Brandow & Johnston, 501 S. Boylston St., Los Angeles, consult. engrs.

▲ **Conn., Montville**—POWER PLANT—Connecticut Light & Power Co., 250 Freight St., Waterbury, power plant addns. **$16,000,000.** United Engineers & Constructors, Inc., 1401 Arch St., Phila., Pa., consult. engr.

▲ **Indiana**—GENERATING PLANT—Ohio Valley Power Corp., (combination fifteen companies) Portsmouth, O., plans 1,200,000 kw generating plant near Ohio-Kentucky border. **$280,000,000.** CD 8/18, under Ohio.

▲ **La., Baton Rouge**—PLANT—Consolidated Chemical Industries, Inc., 111 Sutter St., San Francisco, Calif., sulfuric acid plant, **$3,500,000;** sulfide plant, **$500,000.**

▲ **Missouri or Illinois**—PLANT—Monsanto Chemical Co., 1700 S. Second St., St. Louis 4, Mo., plant and facilities for mfg. of cortisone, either adjacent to 1700 S. Second St., St. Louis, Mo. or near its plant at Monsanto, Ill., **$18,415,000.**

(Continued on page 349)

FIRST MAJOR IMPROVEMENTS IN

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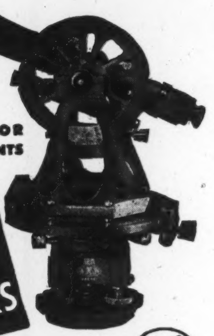

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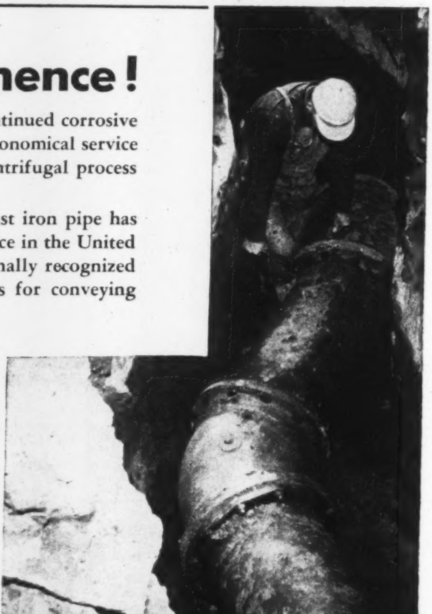

American Cast Iron Pipe Company

Birmingham 2, Alabama

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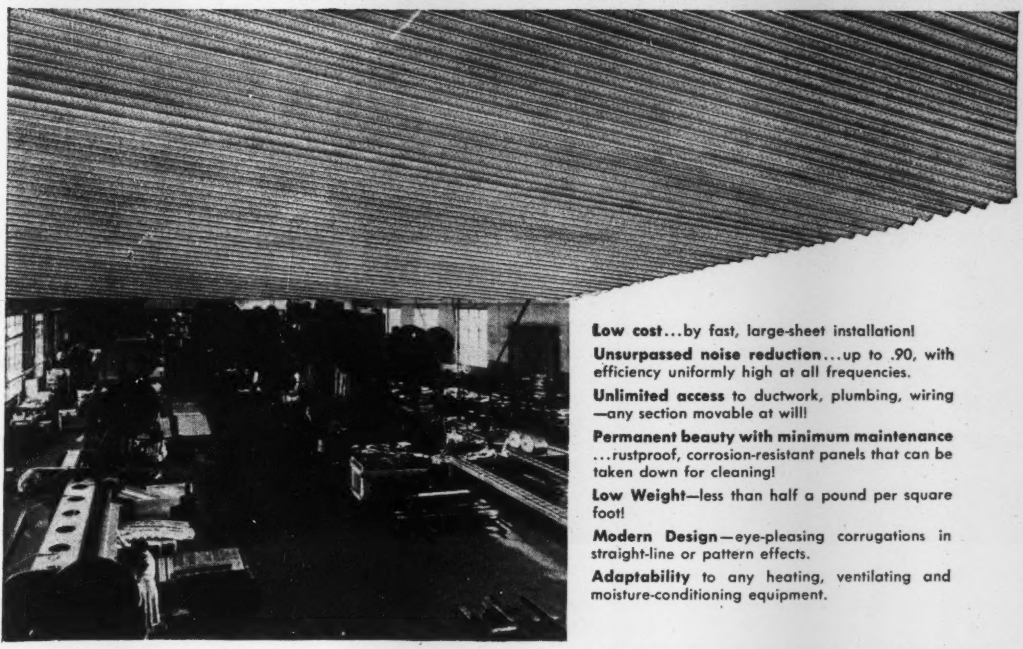


Low cost...by fast, large-sheet installation!

Unsurpassed noise reduction...up to .90, with efficiency uniformly high at all frequencies.

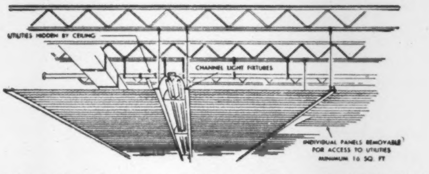
Unlimited access to ductwork, plumbing, wiring —any section movable at will!

Permanent beauty with minimum maintenance ...rustproof, corrosion-resistant panels that can be taken down for cleaning!

Low Weight—less than half a pound per square foot!

Modern Design—eye-pleasing corrugations in straight-line or pattern effects.

Adaptability to any heating, ventilating and moisture-conditioning equipment.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CHANNEL LIGHT FIXTURES
INDIVIDUAL PANELS REMOVABLE FOR ACCESS TO UTILITIES MINIMUM 16 SQ. FT

Typical installation of a suspended acoustical panel ceiling showing method of support for ceiling members and lighting fixtures.

Reynolds Aluminum Acoustical System can be suspended or attached directly to ceilings. Panels are supported at walls by aluminum angles and between walls by aluminum T-sections. The T-sections are suspended from roof, framing, or truss work by wires or metal strips. Sound absorbing material is laid directly on panels or attached to the ceiling above. A completely flexible system providing a noise reduction factor up to .90 and uniformly high at all frequencies.

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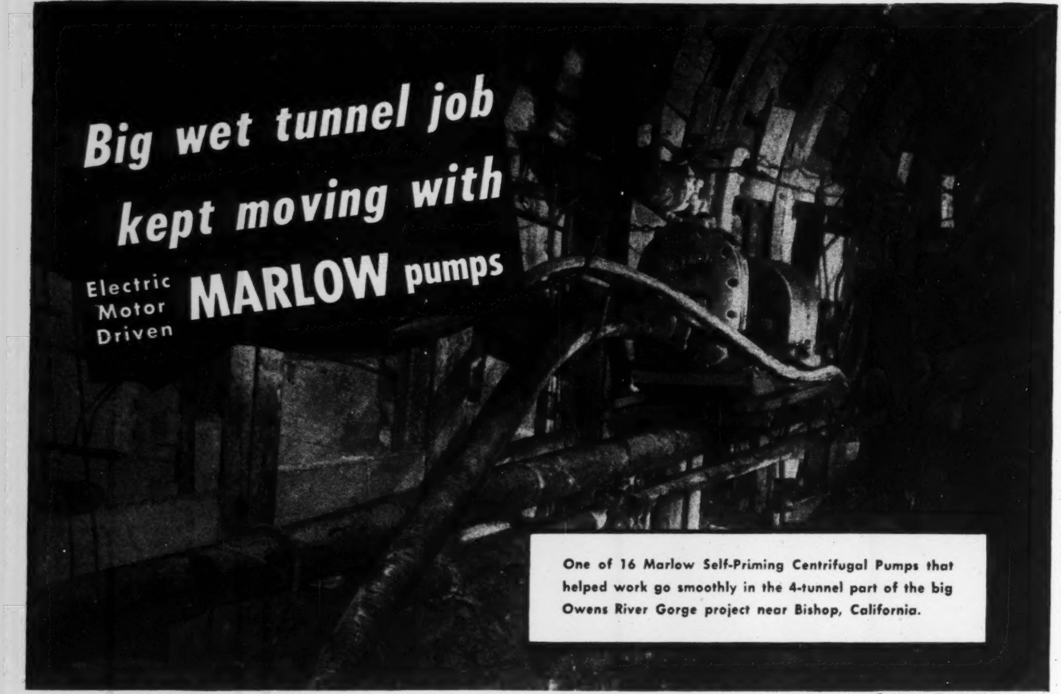
REYNOLDS *Lifetime* ALUMINUM ACOUSTICAL SYSTEM



Big wet tunnel job kept moving with Electric Motor Driven MARLOW pumps

One of 16 Marlow Self-Priming Centrifugal Pumps that helped work go smoothly in the 4-tunnel part of the big Owens River Gorge project near Bishop, California.

Courtesy G. M. Philpott Co.

Marlow electric motor driven Self-Priming Centrifugal Pumps — 16 of them — were used by Owens Tunnel Contractors to help keep water out of the way during tunneling on the Owens River Gorge project. The four tunnels varied in length from 1/3 mile to 7 miles . . . long hard digging. Two of the tunnels were very wet but the Marlows took the flood of water in stride. With the water under control, pouring of the 10½ foot diameter concrete tunnel lining moved along on schedule . . . another success to which Marlow pumps contributed heavily.

Electric motor driven Marlow pumps are used more and more by contractors. Where electric power is available, they offer big advantages in automatic operation and lower operating costs. Electric motor or gasoline engine powered — Marlow Self-Priming Centrifugal Pumps have always been able to do more than any other pumps. The astounding new Marlows are *the greatest contractors' pumps ever built*. They prime faster and higher. They handle more water at lower cost. They are non-clogging, maintenance-free and last longer than any others. And the Marlow selection is largest — models in all AGC ratings, 4M through 240M, 1½" to 10" — plus many other models for special use.

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A Marlow is the only self-priming centrifugal made with a REPLACEABLE IMPELLER AND DIFFUSER. After long, hard use, they can be easily and inexpensively replaced with new ones to restore the pump to full *original efficiency*. A patented Marlow feature.

MARLOW PUMPS

RIDGEWOOD,
NEW JERSEY

Manufacturers of the World's Largest Line of Contractors' Pumps Including the Famous Marlow Mud Hogs

(Continued from page 346)

▲ **Mo., Kansas City**—PLANT—Ruberoid Co., American Asphalt Roof Corp. div., c/o Frank J. McGinley, 7600 Truman Rd., Kansas City, Mo., plant expansion. **$500,000.**

▲ **N. Y., Akron**—PLANT—Carborundum Corp., Niagara Falls, plant to produce zirconium and Hafnium sponge metals for the Atomic Energy Comn. **$2,443,000.**

▲ **Ohio Valley**—POWER PLANTS—Proposed combination of utility operating companies plans to construct two power plants at sites not selected in Ohio and West Virginia to supply power to Atomic Energy Commission's uranium plant at Piketon, O. The company who may make up the combination are:

Ohio Power Co., Indiana and Michigan Electric Co. and the Appalachian Electric & Power Co., (subsidiaries of American Gas & Electric Service Corp.) 30 Church St., New York, N. Y.
Monongahela Power Co.; The Potomac Edison Co. and West, Penn Power Co., (subsidiaries of West Penn Electric Co.) 50 Broad St., New York.
Cincinnati Gas & Electric Co., 4 and Main Sts., Cincinnati, O.
Kentucky Utilities Co., 159 West Main St., Lexington, Ky.
Louisville Gas & Electric Co., 311 W. Chestnut St., Louisville, Ky.
Ohio Edison Co., 47 N. Main St., Akron, O.
Dayton Power & Light Co., 25 N. Main St., Dayton, O.
Southern Indiana Gas & Electric Co., 20 N. W. 4 St., Evansville, Ind.
Toledo Edison Co., Edison Bldg., Toledo, O.
Columbus & Southern Electric Co., 215 N. Front St., Columbus, O.
Pennsylvania Power Co., (subsidiary Ohio Edison) 19 E. Washington St., Newcastle, Pa.

▲ **Okla., Tulsa**—RESEARCH, etc.—Carter Oil Co., Natl. Bank of Tulsa Bldg., main research addn. **$300,000;** laboratory for heavy research work, **$225,000;** warehousing, **$275,000;** products storage, **$250,000.**

▲ **Okla., Yukon**—GENERATOR UNIT—Oklahoma Gas & Electric Co., 315 N. Harvey St., Oklahoma City, 100,000 kw generator unit to be installed in Mustang power plant. **$10,000,000.** Leo Lash, c/o owner, engr.

▲ **Tenn., Memphis**—PLANT—W. R. Grace & Co., 7 Hanover Square, New York, N. Y., anhydrous ammonia plant, **$15,000,000.**

▲ **Tex., Ballinger**—REFINERY, etc. Runnels Gas Products Corp., Ballinger, gasoline production refinery, **$3,011,392;** products storage, **$150,000;** some pipe lines in area of gasoline production plant, **$100,000.**

▲ **Tex., Baytown**—PLANT—Consolidated Chemical Industries, Inc., 111 Sutter St., San Francisco, Calif. sulfuric-acid plant. **$6,500,000.**

▲ **Tex., Calallen**—POWER STATION—Ceneral Power & Light Co., 120 N. Chaparral St., Corpus Christi,

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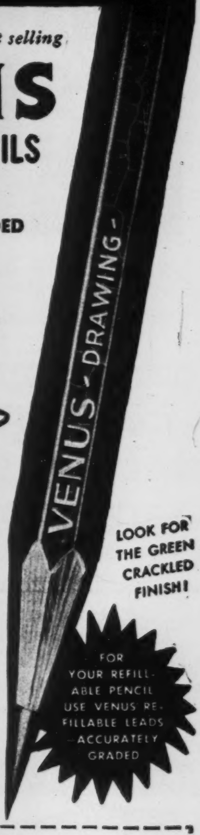

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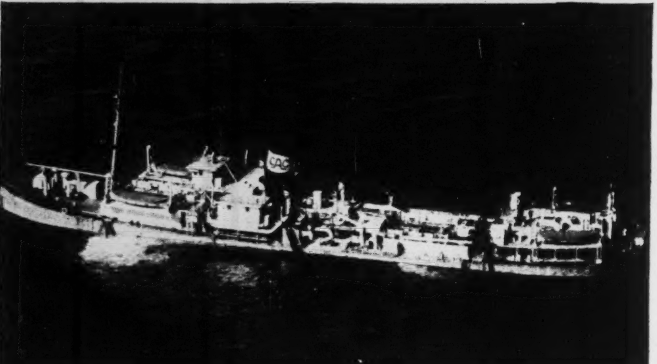

★ In the construction of the New Jersey Turnpike and two runways for Newark Airport, the efficiency of the Sensibar Patented Method, with cost saving results, was again demonstrated. A saving of 12% of the total cost of both projects was realized. Picture show hopper dredge "Sandchief"—one of Construction Aggregates four vessels of this type—at work removing 11 millions cubic yards of sand from the bottom of the Atlantic Ocean as fill-in for marshy areas. C. A. C.'s hopper dredges are both hydraulically self-loading and hydraulically self-unloading.

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Lon C. Hill Power Station, 66,600-kw. $5,500,000. Sargent & Lundy, 140 S. Dearborn St., Chicago 3, Ill., consult. engrs. CD 6/11.

▲ **Tex., Dallas**—LABORATORY, etc.—Chance Vought Aircraft Div., 9314 W. Jefferson St., electronics laboratory, **$750,000**; testing laboratory for aircraft structurals. **$1,000,000**; hangar, **$300,000**; ramps, **$250,000**. jet engine rein.-con. test stands, **$550,000**, at Grand Prairie area.

Tex., Dallas—STORAGE—General Portland Cement Co., Republic Bank Bldg., storage. **$675,000.**

Tex., Dallas — WAREHOUSE-OFFICE — Moncrief-Lenoir Manufacturing Co., 2103 Lyons St., Houston, warehouse-office, Corinth, Gould and Parker Sts. and Santa Fe Ry. **$450,000.**

▲ **Tex., Galveston**—WAREHOUSE—Galveston Wharves, 2402 Mechanic St., 235,000 sq. ft. warehouse, **2,500,000.** CD 1/27/50.

Tex., Henrietta—COMPRESSOR STATION, etc.—Lone Star Gas Co., 1915 Wood St., Dallas, compressor station for use in storing gas underground, **$675,000**; 5 mi. 12 in. gas line between compressor station and underground cavern, **$75,000.**

Tex., Houston—TERMINAL—Columbia Terminals, Inc., 802 N. Nagle St., (Southern Express, Inc., 802 N. Nagle St., subsidiary and occupants), truck freight terminal, **$700,000**; repair garage and storage, equipment, **$150,000**, 5 acre tract, Gulf Terminal Dr. off Gulf Freeway.

▲ **Tex., Lone Star**—POWER GENERATING PLANT—Southwestern Gas & Electric Co., c/o Frank M. Wilkes, Marshall, 40,000 kw. electric power generating plant unit. **$3,500,000.**

▲ **Tex., Longview**—GENERATING PLANT—Southwestern Gas & Electric Co., Marshall, 60,000 to 75,000 kw. electric power generating plant unit, Lake Cherokee, Gregg Co., adjacent Know Lee Plant. **$5,500,000.** CD 11/14/49.

Tex., Plainview—POWER PLANT—Southwestern Public Service Co., Plainview, some electric power plant imprvs. and lines, **$755,000.**

Tex., Port Arthur—REFINERY—Gulf Oil Co., Port Arthur, some addnl. refinery imprvs. **$506,000.** CD 3/22/51.

▲ **Tex., Silsbee**—KILN—Kirby Lumber Co., Kirby Bldg., Houston, kiln facilities for drying lumber, near here. **$1,465,970.**

▲ **Tex., Texas City**—FACTORY—Monsanto Chemical Co., Texas City, venil resins factory. **$1,628,250.** CD 4/28/47.

▲ **B. C., Vancouver**—REFINERY EXPANSION—Shell Oil. Co. of Canada, Ltd., 25 Adelaide St. El. Toronto, Ont., refinery expansion at Burrard Inlet, incl. catalytic cracking unit, gas recovery plant, polymetization and treating units, offices, shops and tanks, more than

(Continued on page 353)

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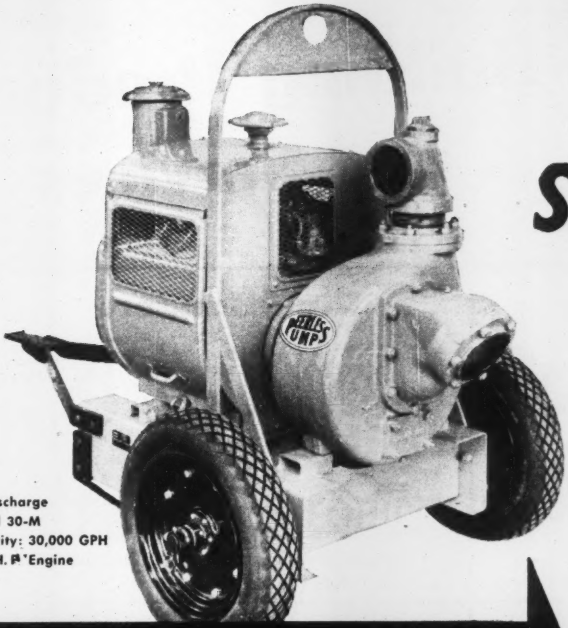

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Model 30-M
Capacity: 30,000 GPH
25.0 H. P. Engine

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Everything you want in a self-priming pump is built into the Peerless line. They're sturdily built for hard service. Priming is fully automatic. Heavy duty impellers are of non-clog design. Steel wheels or pneumatic tires on all wheel models. Air-cooled engines are of nationally-known make. Each pump meets the rated standards of the industry for durability and capacity.

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Capacity: 7000 GPH
3-3½ H. P. Engine

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CAPACITIES FROM 4 TO 30,000 GPH

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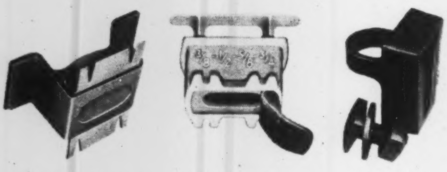

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16 Styles of Concrete Inserts of Malleable and Steel.

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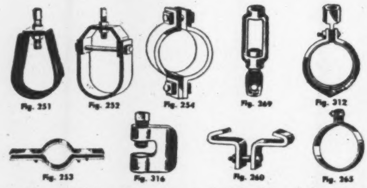

Adjustable Steel and Malleable Pipe Hangers and Supports for all purposes.
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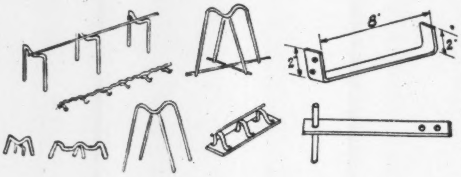

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Anchoring Devices

for Brick, Stone, Tile and Brick.

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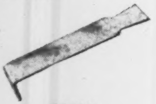

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Kirby 6517

(Continued from page 350)

double present capacity to 15,000 bbl. daily, **$10,000,000.**

▲ **Ont., Toronto**—PARKING GARAGE, etc.—Principal Investments Ltd., 67 Richmond St., W., parking garage and office bldg. on site of Yonge St. Arcade with stores on street floors on Yonge St. and garage entrance on Victoria St. **$2,500,000.**

UNCLASSIFIED

Ariz., Phoenix—UTILITIES—L. B. Holaday, Dean Hawn & John B. Mills, Mercantile Securities Bldg., Dallas, Tex., utilities, viz; roads, sanitary sewers, storm sewers, drainage, water system, site earthwork, gas system, on 160 acre tract. **$275,000.**

▲ **Iowa**—TRANSMISSION LINES, etc.—Iowa Public Service Co., Orpheum-Electric Bldg., Sioux City, 127 mi. 161 kv. transmission line from Hinton to Fort Dodge, via Storm Lake with sub-stations at Hinton and Storm Lake and switching station at Fort Dodge. **$4,225,000.** H. H. Huevelman, c/o owner, ch. engr. CD 3/24.

Kansas—POWER FACILITIES—Great Plains Electric Co-operative, Colby, power facilities expansion, Thomas Co. **$660,000.** J. C. Leavitt Co., Garden City, consult. engrs. CD 8/13/51.

▲ **Louisiana**—OIL PIPE LINE—Interstate Oil Pipe Line Co., c/o Standard Oil Bldg., Shreveport, 137.6 mi. 22 in. crude oil pipe line between Shreveport and Baton Rouge, **$6,250,000;** replacing addnl. 34 mi. sect. of dual 12 in. lines with single 22 in. line between Shreveport and Baton Rouge, **$1,375,000;** 14½ mi. 18 in. crude oil pipe line from Louisiana border to vicinity of Shreveport to connect with Shreveport and Baton Rouge main, **$450,000;** pumping station near Baton Rouge, **$375,000;** pumping station near Shreveport, **$250,000.** CD 3/7/52.

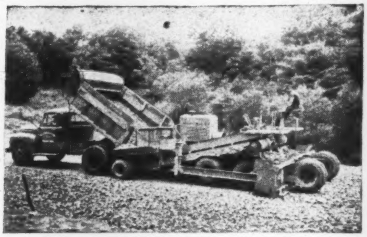
Mo., St. Louis—TELEVISION STATION—Meredith Engineering Co., c/o Meredith Publishing Co., 1716 Locust St., Des Moines, Ia., television station to operate on Channel No. 4, Concord School Rd. in St. Louis Co. near Lindbergh Blvd. **$873,000.**

Nebraska—RURAL DISTRIBUTION LINES—McCook Public Power Dist., McCook, 228.9 mi. rural distr. lines, Lincoln, Hayes, Frontier, Red Willow and Hitchcock Counties. **$250,000.** P. L. Burns, Davenport Bank Bldg., Davenport, Ia., consult. engr. CD 5/16/49.

New Mexico—RURAL DISTRIBUTION LINES—Lee County Electric Co-operative, Lovington, 409 mi. rural distr. lines, in rural area, Lee Co. **$385,000.** CD 3/4/49.

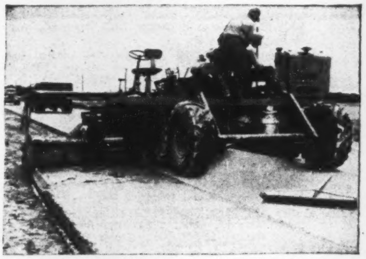
N. M., Albuquerque—TELEVISION STATION—Greer & Greer, Lensic Bldg., Santa Fe, television station. **$355,800.** A. D. Ring & Co., Munsey Bldg., Wash., D. C., consult. engrs.

CUT WIDENING COSTS WITH APSCO EQUIPMENT



Timesaving APSCO Base Paver

A modern machine for handling base paving directly from truck. Accurate width and depth control. Much faster and more economical than the hand method. Easily spreads 160 tons per hour.



Surprisingly versatile widener

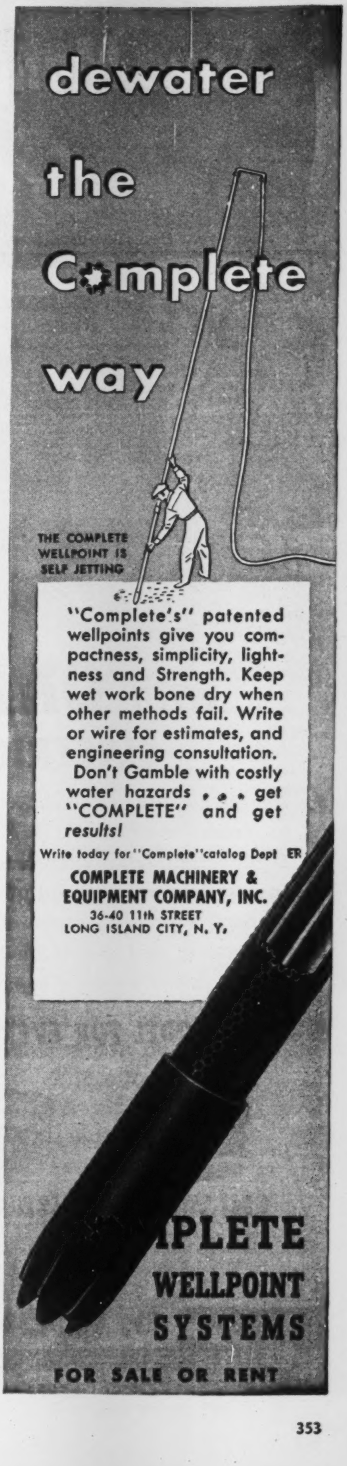
Handles most every aggregate including concrete—fills trenches 2' to 10' wide. (Concrete to 6' wide—*no forms required*) Capacity up to 150 ton per hour and on up to 200 tons per hour building shoulders.

SEND FOR FREE FULL LINE FOLDER

Descriptive folder pictures this equipment in action, gives complete specifications. Send for it! Strengthen your bidding with this money-saving equipment.

Small wonder that you see and hear about APSCO road widening equipment more than any other make! Pioneering in this field has produced exceptionally fine, efficient equipment. Includes road wideners, base pavers, widening chippers, trench rollers, tandem rollers, bituminous paver finishers.

ALL PURPOSE SPREADER CO. Elyria, Ohio U.S.A.



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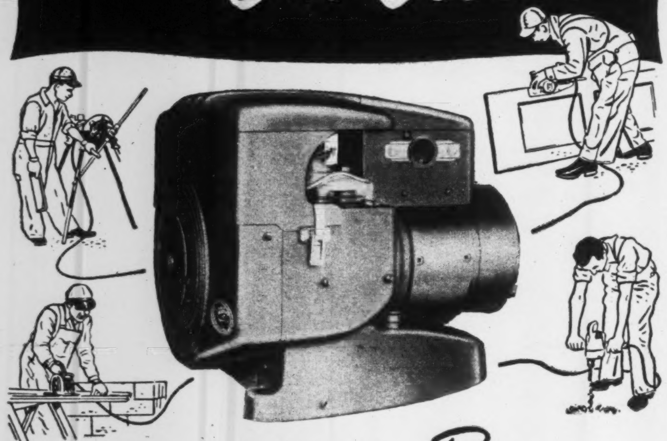

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Use cost-cutting electrical tools on every job from start to finish, even where highline power is not available. Lightweight, heavy-duty Onan Electric Plants supply plug-in electricity *anywhere* for power saws, pipe-threaders, drills, planers, vibrators, repair-shop tools, other motor-driven equipment and lights. Lightweight, air-cooled models: 400 to 5,000 watts. Water-cooled plants to 35,000 watts.

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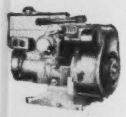

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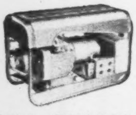
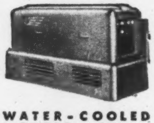


TWO-CYLINDER MODELS—Horizontally-opposed air-cooled. 1,500 and 3,000 watts A.C.—2,000 and 5,000 watts D.C.



WATER-COOLED MODELS — 5,000 to 35,000 watts, A.C. Powered by heavy-duty industrial gasoline engines.

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PRODUCTS

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5738 UNIVERSITY AVE. • MINNEAPOLIS 14, MINN.

N. M., Santa Fe—TELEVISION STATION—Greer & Greer, Lensic Bldg., television station. **$329,450.** A. D. Ring & Co., Munsey Bldg., Wash., D. C., consult. engrs.

N. Y., Albany—TELEVISION STATION—Governor Dongan Broadcasting Corp., 136 State St., television station, **$400,730.** M. W. Garrison, 1519 Conn. Ave. N.W., Wash., D. C., consult. engr.

N. Y., Binghamton—TELEVISION STATION—Southern Tier Radio Service, Inc., 58 Exchange St., television station. **$245,700.** Craven, Lohnes & Culver, Munsey Bldg., Wash., D. C., consult. engrs.

N. Y., Buffalo—TELEVISION STATION—WGR Broadcasting Corp., Rand Bldg., television station. **$558,320.** George C. Davis, Munsey Bldg., Wash., D. C., consult. engr.

N. Y., Elmira—TELEVISION STATION—Elmira Television, c/o Sayles & Evans, 415 E. Water St., television station. **$241,380.** Kear & Kennedy, 1302 18 St. N.W., Wash, D. C., consult. engrs.

N. Y., Schenectady—TELEVISION STATION—Van Curler Broadcasting Corp., Proctor's Theatre Bldg., television station. **$404,000.** George P. Adair, 1833 "M" St., Wash., D. C., consult. engr.

N. Y., Troy—TELEVISION STATION—Troy Broadcasting Co., Inc., 92 Fourth St., television station. **$343,640.** Craven, Lohnes & Culver, Munsey Bldg., Wash., D. C., consult. engrs.

N. Y., Watertown—TELEVISION STATION—Brockway Co., 120-132 Arcade St., television station. **$285,000.** George C. Davis, Munsey Bldg., Wash., D. C., consult. engr. CD 8/30/44.

N. C., Asheville—TELEVISION STATION—Community Television Co., Scenic Bldg., television station. **$422,000.** A. D. Ring & Co., Munsey Bldg., Wash., D. C., consult. engrs. CD 1/9/46.

N. C., Charlotte—TELEVISION STATION—Inter-City Advertising Co. of Charlotte, N. C., Inc., 120 E. Third St., television station. **$449,400.** Craven, Lohnes & Culver, Munsey Bldg., Wash., D. C., consult. engrs.

N. C., Durham—TELEVISION STATION—Durham Radio Corp., 138 E. Chapel Hill St., television station. **$505,545.** A. D. Ring & Co., Munsey Bldg., Wash., D. C., consult. engrs.

N. C., Raleigh—TELEVISION STATION—Capitol Broadcasting Co., Inc., 130 S. Salisbury St., television station. **$380,900.** Kear & Kennedy, 1302 18 St. N. W., Wash., D. C., consult. engrs. CD 3/22/46.

N. C., Raleigh—TELEVISION STATION—WPTF Radio Co., Insurance Bldg., television station. **$523,000.** James C. McNary, National Press Bldg., Wash., D. C., consult. engr. CD 9/18/44.

N. C., Winston-Salem — TELEVISION STATION — Mary Pickford Rogers, 1143 Summit Dr., Beverly Hills, Calif., television station. **$372,778.** A. D. Ring & Co., Munsey Bldg., Wash., D. C., consult. engrs.

O., Akron—TELEVISION STATION—Summit Radio Corp., 106 S. Main St., television station. **$352,755.** Kear & Kennedy, 1302 18 St. N. W., Wash., D. C., consult. engrs. CD 9/18/44.

O., Dayton—TELEVISION STATION—Skyland Broadcasting Corp., 5 S. Jefferson St., television station, **$349,370.** George P. Adair, 1833 "M" St., Wash., D. C., consult. engr.

O., Cleveland—TELEVISION STATION—Cleveland Broadcasting, Inc., 1501 Euclid Ave., television station, **$406,730.** George P. Adair, 1833 "M" St., Wash., D. C., consult. engr.

O., Lorain—TELEVISION STATION—The Lorain Journal Co., 205 Seventh St., television station, **$358,300.** Craven, Lohnes & Culver, Munsey Bldg., Wash., D. C., consult. engrs.

O., Youngstown—TELEVISION STATION—Polan Industries, 321 8th St., Huntington, W. Va., television station, **$326,000.** A. D. Ring & Co., Munsey Bldg., Wash., D. C., consult. engrs.

O., Youngstown—TELEVISION STATION—WKBN Broadcasting Corp., 3930 Sunset Blvd., television station, **$353,000.** M. W. Garrison, 1519 Connecticut Ave. N. W., Wash., D. C., television station, **$353,000.**

▲ **Okla., Oklahoma City**—TELEVISION STATION—Oklahoma Television Corp., 2701 First Natl. Bldg., television station, **$1,350,000.** George C. Davis, Munsey Bldg., Wash., D. C., consult. engr.

Ore., Portland—TELEVISION STATION—KOIN, Inc., New Heathman Hotel Bldg., television station. **$666,300.** E. C. Page, Bond Bldg., Wash., D. C., consult. engr.

▲ **Texas, Arkansas, Tennessee, Kentucky, Ohio, Missouri, Pennsylvania and New Jersey**—PIPE LINE—United States Pipe Line Co., c/o CRC Engineering Service, engrs., M & M Bldg., Houston, Tex., 22 and 24 in. products pipe line. **$78,000,000.**

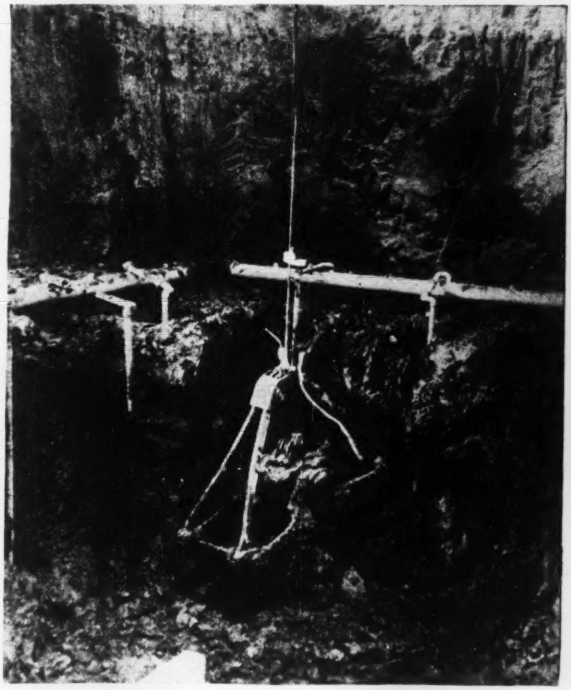
▲ **Texas**—CRUDE OIL LINE—Humble Oil & Refining Co., Humble Bldg., Houston, 41 mi. 18 in. crude oil line from vicinity of Longview to eastern border of Texas. **$1,025,000;** 30 mi. 14 in. crude oil line from Hawkins to Longview, **$575,000.**

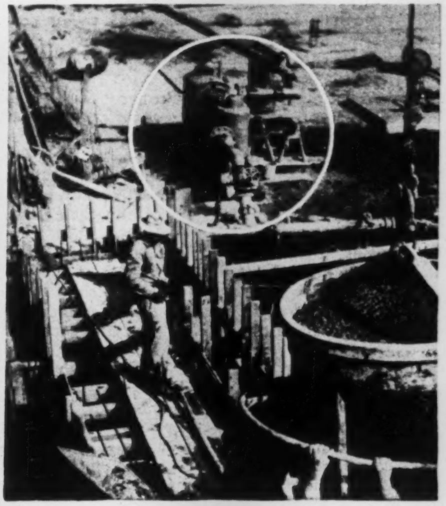
▲† **Va., Norfolk**—PIER EXTENSION, etc.—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, 3 pier extension, land acquisition, ammunition barge mooring at Norfolk Naval Base. **$3,033,000.**

▲ † **Washington** — TRANSMISSION LINE — Bonneville Power Admin., P.O. Box 3537 Portland, Ore., transmission line from Olympia to Aberdeen. **$1,300,000.** CD 2/5/51.

(Proposal Advertisements see pp. 366 to 375)

STANG WELLPOINTS AVERT CAVE-IN IN DEEP VERTICAL EXCAVATION





Above—**Stang Wellpoint installation surrounding pit as construction proceeds in the dry.**

Left—**Note dry, stable vertical banks as Stang Wellpoints pre-drain water-bearing sand.**

The Aetna Construction Company of Los Angeles excavating 10 feet deeper at one end of a 25 feet storage reservoir discovered that underlying the heavy clayey soil was coarse, water-bearing, unstable sand threatening to undermine the general subgrade, and the adjacent concrete construction. Working space was limited by the vertical sides of the cut and by the concrete. This condition was speedily and economically corrected by the use of STANG Wellpoints which permitted excavating and concreting in the limited working area with no undermining of overlying material and no disturbance of adjoining construction.

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WSB opens Cleveland overpay probe

With a reported 75 violations among the first 101 cases checked, the Wage Stabilization Board said this week it would launch a full-scale investigation into overpayments of wages by plastering and mason contractors operating in the Greater Cleveland area.

Karl W. Stoffel, chief enforcement officer for the Cleveland WSB region said the cases covered in his investigation to date covered pay-periods up to March 1, but that there appear to have been "plenty" of other overpayments since then.

Although Stoffel's office has entered negotiations with some of the accused contractors, no formal citations have as yet been issued.

• **Small building field**—The WSB checks have turned up violations for the most part in the small buildings field, with very few among larger commercial builders, the enforcement officer added.

Plasterers have been getting anywhere from one-half cent to 64½ cents an hour above the hourly rate ($3.071½) set on May 19, 1952. Overpayments to masons are reported to have run from 5 cents to 25 cents over the approved $3.12 hourly rate.

• **Builders reply**—Admitting that there "may have been overpayments" since March 1, local builders tended to deprecate the broad inference of Stoffel's statements.

Jack F. Burns, executive secretary of the Local Building Trades Employers' Association, said he felt that there have been few such violations since the wage increases went into effect in May.

"Of course," added Burns, "we're short of construction labor. And when workers are scarce—high rates are in order.

"Generally speaking, the larger builders are holding to the wage scales."

Burns added another fact, however, that will inevitably contribute to the woes of labor-short contractors: the newly announced Atomic Energy Commission plant at Portsmouth, Ohio, will certainly impose a further drain on already tight Cleveland labor supplies.

Lincoln construction trades strike settled

Construction was back to normal in Lincoln, Neb, last week after settlement of a 34-day building trades strike.

Lincoln's three construction workers' unions had accepted terms of an agreement with the Nebraska Associated General Contractors, with pay increases ranging from seven and a half to 22½¢ an hour. Settlement terms are subject to WSB approval.

Bernard Gradwohl, attorney for the three unions—painters and carpenters, hodcarriers and laborers and mason tenders—said the unions, representing about 1,000 workers, were "very well pleased" with the settlement.

Contracts will run until next April 1, with renegotiation scheduled to begin Jan. 1, 1953. Nearly $300,000 in wages was lost during the strike. Contractors' losses were not immediately estimated.

Several contractors had settled earlier, some at rates higher than the general increase. Gradwohl announced that readjustment would be made for the early signers so that they might suffer no penalty as a result of their action.

Picketing enjoined

Members of the Construction and General Laborers Union of Miami, Fla., were enjoined last week by Circuit Judge N. Vernon Hawthorne from picketing a housing project of general contractor Frank J. Rooney.

Judge Hawthorne granted the restraining order without notice to the union which is headed by Max Caldwell, one-time Chicago labor leader.

In his petition, Rooney said the union members formed a picket line because he refused to force employees who were not members of the union to join.

Arkansas carpenters back as contractors raise pay

Carpenter's Local No. 690 and the Labor Committee of the Associated General Contractors, of Little Rock, Ark., reached an agreement last week ending an area-wide walkout of union carpenters. The tie-up lasted four days.

Z. W. Burnett, business agent for the local, announced the end of the walkout. He had represented the carpenters in a series of meetings during the strike.

All Little Rock union carpenters, including those employed on the new University of Arkansas Medical Center and the new St. Vincent's Infirmary, walked out Monday, Aug. 11.

They asked for a wage scale of $2 to $2.25 an hour.

The AGC agreed to a hike to $2.17½¢ an hour if it is approved by the Construction Industry Stabilization Commission. The raise will take effect in the first full payroll period after approval is given.

It is estimated that approval (or rejection) will take 45 to 60 days.

The walkout, which had slowed or halted numerous building projects, had idled about 400 carpenters for the four days. The local has about 750 members, but the other 350 are working on jobs outside the Greater Little Rock area, Burnett said. No picket lines were used.

• **Pine bluff**—Another Arkansas strike ended when workers went back to work on the multi-million dollar Pine Bluff Arsenal job.

The strike which had lasted two days was started by some 1,000 AFL pipefitters.

The union's business agent, Earl Griffin of El Dorado, said the strike resulted from an "inequity" on the night shift.

Blaw-Knox Construction Co. is the prime contractor.

Labor briefs . . .

• **Ironworkers strike**—A sudden walkout of 2,200 structural ironworkers in New England threatened to halt more than $100 million in building projects last week. Layoff of 30,000 construction workers was threatened if picket lines were set up. Stalemated negotiations between the AFL ironworkers and two associations representing builders brought about the protest strike.

• **End Milwaukee strike**—A strike of 600 AFL steamfitters ended at Milwaukee, after a settlement including a ten-cent hourly wage increase and a seven-cent-an-hour contribution for a welfare plan. The strike lasted almost exactly a month.

• **Raise for concrete workers**—Over 500 employees of 18 member companies of Arizona's ready-mix concrete, sand and gravel industry received a five-cent hourly wage increase.

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents
October Materials, and Labor Prices will appear in October 9, 1952 issue

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C/L lots cash. dis. not deducted			SAND AND GRAVEL Per ton. carload lots			CRUSHED STONE Per ton. carload lots		CRUSHED SLAG Per ton. carload lots, f.o.b. plant		CONCRETE BLOCK 8 x 8 x 16-in.; truckload del.; per block		CONCRETE Ready Mixed
	Paper	Bulk	Mortar	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand grav.	Lt. wgt. agg.	1:2:4, over. 50 c.y., del.
Atlanta......	$3.81	$3.50	3.30	$2.00	$2.00	$1.75	$2.10	$2.10	$1.65	$1.85	$0.19	$0.19	$11.50
Baltimore....	3.76	3.45	3.38	2.50‡a	2.50‡a	2.00‡a	2.70‡a	2.80‡a	2.60‡a	2.55‡a	.17	.17a	10.80
Birmingham..	3.11	2.81	....	2.24n	2.24n	1.94n	2.50	2.50	1.10	1.30	.165	.165	9.75
Boston......	4.01	3.69	3.81	2.50a	2.50a	2.50a	1.50a	1.60a	....	....	.20	.22a	11.50h
Chicago.....	3.33	3.02	....	3.00‡b	3.00‡b	3.40‡b	3.00‡b	3.00‡b	2.00‡	2.00‡	.22	.22b	11.44/11.94
Cincinnati...	3.61	3.40	3.40	2.09‡c	2.14‡c	2.14‡c	2.44‡e	2.44‡e	....	....	.21	.225a	10.95
Cleveland....	N. A. in C. L.		....	2.05ef	1.85f	1.65	3.81a	3.81a	2.95‡	2.95‡	....	.23	12.40d/13.00g
Dallas.......	2.95	2.65	2.70	2.18	2.28	1.84	2.22	2.38	....	....	.125e	.215	9.30
Denver......	3.89	3.59	3.89	1.85	2.00	1.20	....	....	...	....	.22	.255a	10.50
Detroit......	3.27	3.00	3.05	4.25‡b	4.25‡b	3.75‡b	4.25‡	4.25‡	4.25‡	4.25‡	.19	.20a	10.75f
Kansas City..	3.30	3.03	3.15	1.85‡	1.85‡	1.50‡a	2.00‡a	2.00‡a	....	....	.18ag	.23c	11.35b
Los Angeles..	4.00a	3.60a	4.72	1.95a	2.20a	1.95a	1.95a	2.08a	....	....	.11fm	.22m	10.43lh
Minneapolis..	3.80d	3.49d	3.41	2.30‡ag	2.30‡ag	1.35‡ag	2.50‡ag	2.50‡ag	....	....	.21ik	....	11.65fi
Montreal....	3.01ac	2.86ac	....	2.50	2.50	2 25	1.05ij	1.30ij	....	....	:20	.20a	9.65ah
New Orleans.	3.20	3.02	3.18	2.32	2.32	1.82	....	....	1.05	1.25	.25	——	12.90
New York...	3.86	3.55	3 43	2.35bk	2.35bk	1.60bk	2.50bl	2.50bl	....	....	....	....	11.80an
Philadelphia..	3.43/3.82‡	3.12/3.49‡	3.43/3.48‡	2.75‡	2.75‡	2.15‡	2.10‡	2.15‡	1.75	1.65	.22/.25	....	11.50
Pittsburgh...	3.32	3.04	3.32	2.15‡	2.15‡	2.10‡	2.60‡	2.60‡	2.15	2.15	.23d	.23d	12.50
St. Louis....	3.27/3.48b	2.84/3.10b	3.05/3.22	2.90am	2.90am	2.30/2.70am	1.70j	1.70j	1.50	1.50	.215	.26ei	10.40
San Francisco	3.36	2.96	....	1.92	1.92	2.02	2.02	2.02	....	....	....	.23cl	10.70c
Seattle......	3.75a	3.25a	4.50h	3 00‡bm	3.00‡bm	3.00‡bm	3.50‡bm	3.50‡bm	....	....	.24j	.3325j	11.40j

‡Delivered. * Prices incl. dealers comm. except as noted.
CEMENT: a Subj. to 10¢ dis. b Less 2% for cash. c CL price dealers' comm. not incl. d Dealers sell only LCL. h LCL.
SAND, GRAVEL, STONE & SLAG: a Truck lots. b Per cu. yd. c 5 tons or more. e ¾". f Pea gravel. g Less 5% for cash. h Less than 5 tons. i Sales tax incl. j F.o.b. quarry. k Barge lots aed. l F.o.b. scow Hudson river. m Less 2% for cash. n F.o.b. cars.

CONCRETE BLOCK: a Cinder. b Waylite. c Haydite. d Celocrete. e 5½ x 8 x 12 in. f 8 x 4 x 16. g F.o.b. truck at job. i Less 2% for cash. j Less 1% for cash. k 8x8x18. l F.o.b. plant San Rafael. m F.o.b. yard.
READY MIXED CONCRETE: a 5 cu. yds. or over del. Man. b 25 cu. yds. or more. c 10–100 cu. brackets. d 1–3 mi. zone. e 2,000 lb concr. f 2500 lb. comp. g Aver. haul 7–9 mi. zone. h Less 50¢ for cash. i 5% off for cash. j 2% off for cash. k Sales tax included. l 1:2½:4. m F.o.b. yard. n Plus escalator clause.

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10c. per bbl. for payment within 15 days of date of invoice. Subject discount 10c. per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For paper bags add 30¢ per bbl., not refundable

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn....	$2.60†	Buffington, Ind........	$2.55†	Steelton, Minn........	$2.65†	Muskegon, Mich.......	$2.70†	Toledo, O.............	$2.60†
Clinchfield, Ga........	2.60†	Independence, Kan....	2.50†	Leeds, Ala............	2.45†	Saginaw, Mich........	2.60†	Milwaukee, Wis.......	2.75†
Kingsport, Tenn.......	2.60†	Hannibal, Mo.........	2.55†	Duluth. Minn..........	2.65†	Wyandotte, Mich......	2.60†	Green Bay, Wis........	2.75†
West Des Moines, Iowa.	2.65†	Northampton, Pa......	2.60†	Hudson, N. Y..........	2.60†	Buffalo, N. Y..........	2.60†	Ironton, O.............	2.60†
Nazareth, Pa..........	2.60†	Universal, Pa.........	2.65†	Alpena, Mich..........	2.50†	Oswego, N. Y.........	2.75†	Montreal City.........	2.61
Bath, Pa..	2.60†	Waco, Tex. (+ 10¢ tax)	2.50†	Detroit, Mich.........	2.60†	Cleveland, O..........	2.60†	W. Winfield, Pa.......	2.65†

† *Prices to hold for third quarter of* 1952.

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT Per ton, less than 80 penetration		ASPHALT BINDERS—FLUXES Per gal., 80–300 penetration		CUTBACK ASPHALT Per ton		ROAD OIL Per gal.	ASPHALT EMULSION (Quick-breaking) Per gal.	
	Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Tank car	Tank car	Drums
Atlanta........	$73.00	$35.00	$2.25	$26.00	$33.25	$0.1975	$0.339	$0.095w	$0.185w	$0.105	$0.115	$0.225
Baltimore......	150.00‡	58.00‡	——.	22.00	.....	.0809	0.15	.09w	.17w	.09i	.09	0.12
Birmingham...	......	45.50i	..—.	......	.....	.....	.....	......	......	......	......	......
Boston........	......	......	.....	24.50a	35.50a	22.00av	35.50av	......	......	.09a	.105a	.22a
Chicago.......	155.00‡	90.00‡b	4.40/4.60‡f	20.25b	30.25b	19.25bv	29.25bv	.0875bw	.16bw	.075b	.....	.....
Cincinnati.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland......	200.00	55.00d	4.27g	23.00[A]	.....	23.00[A]	....	.1025[A]w	.19[A]w	.....	.11[A]	.19[A]
Dallas.........	e	40.00	e	24.05	43.09	.1016	.2103	27.09	47.87	.0980	.1041	.2128
Denver........	——.	48.00	——.	.....	....	.....	.....	.....	.....	.....	.....	.....
Detroit........	——.	92.00	——.	26.82	....	26.82v	.....	.117w	.....	.0925	.....	.2811
Kansas City...	e	e	e	18.55cl	...	.055	.....	.0725ew	.....	.0635e	0.435	.....
Los Angeles....	e	——.	e	15.50dmz	...	15.50dvz	....	17.00dz	.....	16.00dv	.0825j	.1525j
Minneapolis....	——.	——.	2.83h	23.90	....	22.895	.....	.0894w	.....	.0794	.0935	.....
Montreal......	....—	e	e	27.10n	36.65n	.135n	.183n	16.30nu	18.80nu	.132n	.184ns	.225ns
New Orleans...	.....	——.	.....	17.50e	.....o	17.50ev	.....o	.085ew	.....o	.0825[B]	.085[B]	.....
New York.....	.....	.....	3.12f	26.26q	47.59q	25.26st	46.58st	.1071w	.2021w	.1071	.1072	.1993
Philadelphia...	175.00	110.00	4.06	22.00	....	.....	.....	.095u	.....	.....	.....	.....
Pittsburgh.....	165.00	48.00	4.60	23.00	37.00	.10	.20	27.00	39.00	.095	.09	.205
St. Louis......	.....	.....	.....	18.68f	....	.1698	.....	.0865/.089w	.....	0.15	.0975	.....
San Francisco..	.....	55.00e	.....	17 00g	32.50gp	17.00gkv	22.50gkv	19.00g	36.50g	17.50v	.085y	.....
Seattle........	.....	.....	.....	17.00h	37.50h	16.25hv	.....	19.50h	....	18.50hs	.095h	.105hr

‡ Delivered.
PAVING BRICK & BLOCK: a CL. b 3½ x 4 x 8½. c 2½ x 8½ x 4. d LCL, truck deliveries. e Not used. f 2" interior 6# treat. g 3". h 8# treat. i 3 x 3⅝ x 8½.
ASPHALTS: a Price at plant, Everett, Mass. b F.o.b. refinery, Lockport, Ill. c F.o.b. Sugar Creek, Mo. d F.o.b. refinery, El Segunda. e F.o.b. Baton Rouge. f F.o.b. Wood River or Roxana, Ill. g F.o.b. Richmond, Calif. h F.o.b. Martinez. i Bulk refinery. j F.o.b. refinery, Inglewood, Calif. k 50–110 penetr. l Less than 100 penetr. m 40–80 penetr. n Tax incl. o Drums not avail. p Shipped in steel bbl. q 40–85 penetr. r In customer's drums. s Shipped in drums, per drum. t 85–300 penetr. u Per 100 gal. v Per ton. w Per gal. x Also tank trucks. y F.o.b. Oakland. A F.o.b. refinery Cleveland. B. F.o.b. Norco, La.

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES—	PLATE CARBON STEEL	REINF BARS billet	RIVETS* ½-in. structural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	STEEL RAILS Per Net Ton Re-rolled	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track* Bolts
Birmingham Area...	$3.85	$3.90	$3.95	$7.85	....	$75.50	$85.00	Not	$4.925	$6.65	$4.775	....
Chicago Area......	3.85	3.90	3.95	7.85	$4.675	75.50	85.00	avail-	4.925	6.65	4.775	....
Pittsburgh Area....	3.85	3.90	3.95	7.85	4.675	75.50	85.00	able	4.925	6.65	4.775	$9.85
Buffalo Area.......	3.85	3.90	3.95	7.75	4.675	75.50	85.00	....	4.925	6.65	4.775	9.85
Cleveland..........	....	....	3.95	7.85	4.675	......	......	....	....	....	....	9.85
Youngstown Area.....	....	....	3.95	....	....	......	......	....	....	6.65	....	....
Geneva............	3.85	3.90	....	....	....	......	......	....	....	....	....	....
Los Angeles........	....	....	....	....	....	......	......	....	....	6.65	....	..
Pueblo............	3.85	3.90	3.95	....	....	75.50	85.00	....	4.925	6.65	4.775	9.85

*New incr not available as we go to press

IRON AND STEEL PRODUCTS—F. O. B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS* Per 100 lb., base price *u* 5 tons to carload lot *b* New billet	REINFORCING BARS* 5 tons to carload lot *b* Rail steel	REINFORCING BARS* Add switch	REINFORCING BARS* $/cwt for Del.	EXPANDED METAL LATH*k* Per 100 sq. yd., carload lots Std. diamond mesh. 3.4 lb.	EXPANDED METAL LATH*k* Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING*d* Per 100 sq. ft., carload lots 4x16 in., No. 5 & 10 wires	WELDED FABRIC REINFORCING*d* 4x12 in., No. 8 & 12 wires	WELDED FABRIC REINFORCING*d* 6x6 in., No. 6 & 6 wires
Atlanta.......	$7.31	$7.04	$7.04	$.025	$...	$36.00‡	$40.00‡	A.P.M.• Joliet, Illinois, Donora, Penn., $2.81 F.o.b. Mill: Monessen, Penn., $2.96	A.P.M.• Joliet, Illinois, Donora, Penn., $1.96 F.o.b. Mill: Monessen, Penn., $2.02	A.P.M.• Joliet, Illinois, Donora, Penn., $2.95 F.o.b. Mill: Monessen, Penn., $3.06 • At Producing Mill
Baltimore.....*	6.15	5.49*l*	....	....	....	42.00	45.00			
Birmingham..*	5.70	5.75	5.75	.05	.15	47.00*p*	52.00*p*			
Boston.......*	6.20*a*	6.19	6.19	....	....	39.50	43.50			
Chicago......*	5.70	4.95*ff*	4.95*ff*	.0625	....	45.00*C*	50.00*C*			
Cincinnati....*	6.27*ak*	5.88*r*	....	....	.15	38.50*szee*	41.00*szee*			
Cleveland......	6.30	4.81*v*	....	....	....	37.00‡	40.00‡			
Dallas........*	8.85	7.00	7.00	....	....	49.00	52.00			
Denver.......*	7.35	7.25*c*	....	....	....	50.00*s*	62.00*qs*			
Detroit.......*	6.12	5.75*n*	....	....	.20	53.00	58.00			
Kansas City..*	7.07*nn* Est	7.50# Est	....	....	....	41.00 Est	44.00 Est			
Los Angeles....	6.80*fhh*	6.82*g*	....	....	....	48.00	54.00*kk*			
Minneapolis...*	6.15*hh*	7.12*ll*	7.12*ll*	....	....	37.00	39.50			
Montreal......	6.65*iB*/6.75*A*	4.75*i*	4.75*g*	....	....	51.00*h*	57.00*h*			
New Orleans...	....	5.55*ok*	....	.05	....	66.00	60.00			
New York.....	6.69#	6.25	6.25	....	.30	38.50*st*	45.00*st*			
Philadelphia..*	6.10	6.15	....	....	....	38.00‡	42.00‡			
Pittsburgh....*	5.40/5.60	5.40/5.60	....	....	.10	36.60	38.60			
St. Louis.....*	6.02*a*	5.50*c*	5.50*c*	....	....	47.00*aa*	53.00*aa*			
San Francisco.*	7.75*ii*	6.50*l*	....	....	....	40.50	43.50			
Seattle.......*	4.30*e*	5.55*el*	....	....	....	57.00*smm*	47.00*smmx*			

‡ Delivered. *b* 1–5 tons, add 35¢. Less than 1 ton, add 50¢. *c* 20 tons or over base. *d* Mill price plus freight. *e* F.o.b. plant. *f* Includes delivered in free delivery zone. *g* 10,000 to 39,999 lbs. *h* List price. Dominion tax exempt. Provincial and Municipal tax extra. *i* Plus Dominion, Provincial any Municipal sales tax. *j* Price per ton. *k* F.o.b. city. *l* Intermediate and hard grade, new billet. *m* Per sq.yd. *n* 5–10 tons. *o* 5 to 20 tons base. *p* Del. of 500 sq. yd. or more. *q* Std. ribbed. 4 lb. per sq. yd. *r* 5 tons or over. *s* LCL. *t* Asphalt coated. *u* Note: Revised size extra — 1 in., 1⅛ in., 1¼ in., 10¢, ¾ in., ⅞ in., 15¢, ⅝ in., 25¢, ½ in., 50¢, ⅜ in. 80¢, ¼ in. $1.90. *v* 20 tons. Straight. *w* Copper bearing. *x* 2.5 lb. per sq. yd. *y* $0.0093 transportation tax included. *z* Copper alloy. *aa* Delivered truck to job. Contractor to do unloading. *dd* F.o.b. dock. *ee* F.o.b. cars. *ff* Carload lots. *gg* Including sales. *hh* 10,000–19,999 lbs. *ii* 400–999 lbs. *kk* ¾" ribbed. *ll* 5 to 8 tons, f.o.b. city. *mm* 2% off for cash. *nn* 1–5 tons. # 10 tons to CL. *a* 2000–9999 lbs. *A*. Amer. struct'l shapes. *B*. Canadian shapes. *C*. Deliv to contractor. * Subj. to adj. of new incr. not yet avail. E, 6.77 Wide flange beams

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in. to 24 in.*a*	ASBESTOS CEMENT PIPE per lin. ft., f.ob. city 6" Pr Cl. 150	ASBESTOS CEMENT PIPE 12" Sew Cl. I	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13-44T std. 8 in. s.s.	VITRIFIED SEWER PIPE std. 12 in. s.s.	VITRIFIED SEWER PIPE 24 in. ds.	VITRIFIED SEWER PIPE 36 in. ds.	CLAY DRAIN TILE ASTM C4-24 Per 1,000 ft., carload lots, f.o.b. 6 in.	CLAY DRAIN TILE 8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTMC 14-41 12 in.	CONCRETE SEWER PIPE 24 in.
Atlanta.......	$101.00	$1.44	$2.42	....	.....	.....	.....	......	......	......	.....
Baltimore.....	109.00	1.46	2.42	.546	1.053	4.275*A*	11.3775*A*	178.20	274.80	.90	2.45
Birmingham...	93.00	1.44	2.42	.42	.75	2.99	....	250.00‡	375.00‡	1.25*m*	2.75*m*
Boston.......	113.00	1.46	2.20	.553*uvx*	1.0665*uvy*	4.41*uvy*	11.90*uvy*	187.80*v*	289.20*v*	1.55*mg*	3.80*mg*
Chicago......	107.00	1.44	2.20	.70*m*	1.35*m*	5.62*m*	13.50*m*	150.00‡	270.00‡	.80	2.80
Cincinnati.....	106.00	1.46	2.29	.567*y*	1.093*y*	4.32*y*	11.175*y*	164.40	254.10	.75*m*	2.80*m*
Cleveland.....	108.00	1.46	2.29	.49*x*	.945*x*	3.96*x*	10.66*x*	158.00*m*	245.65*m*	.75*m*	2.95*m*
Dallas........	112.00	1.46	2.54	.436	.822	3.234*b*	9.17*b*	......	......	.49	1.60
Denver.......	115.00	1.55	2.54	.43*dd*	.74*dd*	3.18*dd*	....	......	......	.74*m*	2.50*m*
Detroit.......	108.00	1.46	2.29	.72	1.39	5.58	14.91	240.00*m*	360.00*m*	.80	3.20
Kansas City...	113.00	1.46	2.29	.515	.92	3.64	9.20	216.70	465.00	.70*g*	3.00*g*
Los Angeles....	124.00	1.53	2.29	.51*f*	1.07*f*	5.24*f*	13.06*f*	228.20*f*	348.90*f*	.95	2.70*ff*
Minneapolis*..	112.00	1.50	2.42	.72*mo*	1.32*mo*	5.32*mo*	....	......	......	1.36*h*	3.87*h*
Montreal......	115.00	....	....	.85*z*	1.50*z*	5.25*z*	....	......	......	1.17*j*	3.11*j*
New Orleans...	101.50	1.44	2.42	.513	.93	5.15	....	265.00*bb*	450.00*bb*	.65	2.29
New York.....	111.35	1.46	2.20	.64	1.21	4.86	12.71	......	......	1.15	2.50
Philadelphia...	110.00	1.44	2.20	.65	1.25	4.95*A*	12.65*A*	300.00‡	350.00‡	1.55*h*	3.75*h*
Pittsburgh.....	109.00	1.46	2.20	.406*m*	.772*m*	2.85*m*	7.652*m*	147.00	230.00	1.05*h*	2.50*h*
St. Louis......	112.00	1.46	2.29	.51	.93	3.65	8.58	160.00*l*	300.00*l*	1.20*il*	2.70*hl*
San Francisco..	122.00	1.55	2.29	.61*d*	1.20*d*	5.03*d*	12.57*d*	240.00*l*	400.00*l*	.95	3.20
Seattle........	124.00	1.55	2.42	.51*b*	.91*b*	...	....	150.00*c*	......	.86*ee*	2.56*ee*

‡ Delivered. *a* Class B & heavier. Based on existing freight rates; subject to rate change. Gas pipe and class A. $5 per ton additional. 4 in., $7 per ton additional. 30 in. and larger, usually, $1 per ton less. *b* Extra strength ASTM C 200–44T. *c* 4-in., $90. *d* SS361-A. *e* 30-in. *f* F.o.b. factory. *g* Culvert pipe. Reinforced, ASTM C76–41. *h* Reinforced, ASTM C75–41. *i* Reinforced, ASTM C76–37. *j* Centrispun. No. standard specifications in Can. *l* F.o.b. plant. *m* Truck delivery. *o* Listed price is based on LCL (no minimum). *p* Less than 5 tons, per price per ft. *t* Within switching limits. *u* ASTM C13–40. *v* C.L.f.o.b. origin, freight allowed. *x* 2 ft. lengths. *y* 3 ft. lengths. *z* CESA A 60–1941 specifications used. *aa Extra strength ASTM C-200–50.* A standard strength. * 6" to 8", $1.67 per ft.; carlots, F.o.b. track Class 150. *bb* Freight allowed to destination in city. *cc* Truck loads; f.o.b. plant, Newton. *dd* LCL delivered, f.o.b. truck. *ee* 1% off for cash. *ff* 21.

—*WROUGHT STEEL PIPE—

(Full standard weight)

Mill	2½ & 3 in., Butt Weld† Black %	2½ & 3 in., Butt Weld† Galv. %	3½ to 6 in., Lap Weld† Black %	3½ to 6 in., Lap Weld† Galv. %
Lorain, Ohio.......*	40.0	26.25	.....	.....
Aliquippa, Pa......*	43.5	23.5	36.5*a*	16.5*a*
Sparrows Pt., Md.*	41.5	23.0	33.5*a*	14.0*a*
Benwood, W. Va...*	43.5	23.0	38.0*c*	17.0*c*
Youngstown, O....*	43.5	25.0	.....	.....
Indiana Harbor, Ind.*	42.5	24.0	35.5*a*	16.5*a*
Sharon, Pa........*	43.5	21.0	.....	.....
Wheatland, Pa......	43.5	23.5	38.5*a*	16.5*a*
Etna, Pa.........*	43.5*b*	23.0*b*	38.0*cb*	17.0*cb*
Fontana, Calif.....*	32.0*b*	18.5*b*	24.0*ab*	10.0*ab*

† Threaded and coupled. *a* 3½ to 4 in. *b* Continuous weld. *c* 5 and 6 in. *New disc not available as we go to press.

* WROUGHT STEEL PIPE: Discounts from standard list consumers carload prices. Base price approx. $200 per net ton. List prices per ft.: *Butt Weld:* ⅛ in., 5½¢; ¼ in., 6¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 76½¢. *Lap Weld:* 3½ in., 92¢; 4 in., $1.09, 5 in., $1.48; 6 in., $1.92. Freight rates to destination to be added to price plus 3 percent tax on transportation.

WROUGHT IRON PIPE: List prices per ft. same as wrought steelpipe. Discount for Pittsburgh base. *Butt Weld* — 1 in. black, + 25.75, galv. + 57.0; 1¼ n. black, + 25.75, galv. + 56.5, 1½ in. black, + 19.25 galv. + 52.75; *Lap Weld* — 2½ in. to 3½ in. black + 26.25, galv. + 55.5; 4½ in. to 8 in. black + 23.0, galv. + 50.75. Freight rates to destination to be added to name delivered price.

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

SHORT LEAF YELLOW PINE AND DOUGLAS FIR
All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)
All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1 Lengths up to 20 ft. *(Prices in italics)*

LONG LEAF Y. P. Merchantable grade up to 20 ft.

PLYWOOD Rail freight increment (See note for base *price*)

	Short Leaf Y. P. and Douglas Fir									Long Leaf Y. P.		Plywood	
	1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh	2x12 Rgh	12x12 Rgh	⅝"	¾"
Atlanta †	**$75.00**	**$78.00**	**$69.00**	**$71.00**	**$75.00**	**$78.00**	**$77.00**	......	......	......	......	$22.32	$27.24
Baltimore *	**90.00**	**92.00**	**75.00**	**75.00**	**80.00**	**85.00**	**110.00**	......	......	**$148.00**	**$148.00**	25.92*	31.60*
	109.50g	*109.50g*	*109.50g*	*109.50g*	*109.50g*	*108.00g*	*109.50*	*$119.50*	*$119.50*	......	......	.....	.....
Birmingham †	**83.50**	**83.50**	**70.50**	**80.50**	**83.50**	**85.50**	**95.50**	......	......	**115.50**	**155.50**	21.78	26.58
	85.50	*85.50*	*80.50*	*79.50*	*78.50*	*78.50*	*85.50*	*85.50*	*85.50*	......	......		
Boston	**104/108^{n}a**	**108/112^{n}a**	**98/101^{n}a**	**99/106^{n}a**	**98/100^{n}a**	**98/100^{n}a**	......	......	......	......	......	25.92*	31.60*
[3]	*95.00*	*95.00*	*108/112*	*110.00*	*110.00*	*110.00*	*118/120*	*124.00*	*124.00*	......	......	.....	.....
Chicago **	**100.00**	**105.00**	**92.00**	**100.00**	**101/102**	**105/106**	**105.00**	......	......	**134.00**	**134.00**	22.45*	27.37*
	100.00	*101/102*	*104/105*	*108.00*	*108/110*	*108/110*	*110.00*	*110.00*	*110.00*	......	......	.....	.....
Cincinnati *	**99.00**	**105.00**	**88.00**	**98.00**	**105.00**	**110.00**	**122.50**	......	......	**145.00**	**145.00**	25.00*	30.48*
	115.00	*115.00*	*117.00*	*117.00*	*117.00*	*115.00*	*145.00*	*145.00*	*145.00*	......	......	.....	.....
Cleveland **	**97.00**	**101.00**	**86.00**	**92.00**	**98.00**	**101.00**	......	......	......	......	......	25.37*	30.93*
	......	......	*107.00*	*107.00*	*112.00*	*112.00*	*115.00*	*120.00*	*120.00*	......	......	.....	.....
Dallas k†	**78.00**	**80.00**	**69.00**	**58.00**	**59.00**	**59.00**	**98.00**	......	......	**108.00**	**98.00**	18.72	22.80
Denver *	*Not in stock*		*133.00*	*132.00*	*131.00*	*130.00*	*139.00*	*155.00*	*155.00*	......	......	13.92	16.98
Detroit ‡	**110.00**	**112.00**	**102.00**	**110.00**	**114.00**	**115.00**	......	......	......	......	......	25.00*	30.48*
	101.50	*102.50*	*111.50*	*112.25*	*111.25*	*110.00*	*118.75*	*122.50*	*122.50*	......	......	.....	.....
Kansas City *	**122.00**	**122.00**	**122.00**	**122.00**	**122.00**	**122.00**	......	......	......	......	......	16.56	20.16
	122.00	*122.00*	*122.00*	*122.00*	*122.00*	*122.00*	*147.50*	*157.50*	*157.50*	......	......	.....	.....
Los Angeles [1]	*96.00*	*96.00*	*96.00*	*96.00*	*96.00*	*96.00*	*114.00*	*124.00*	*114.00*	......	......	16.61*ab	20.25*ab
Minneapolis #	*130.00*	*130.00*	*135.00*	*135.00*	*135.00*	*135.00*	*150.00*	*150.00*	*150.00*	......	......	19.89*	24.25*
Montreal	ab85.00	90.00	85.00	90.00	100.00	100.00	......	......	......	......	......	.....	.....
	175.00	*175.00*	*175.00*	*175.00*	*175.00*	*175.00*	*175.00*	*175.00*	*170.00*	......	......	.....	.....
New Orleans †	**100.00**	**100.00**	**92.50**	**85.00**	**90.00**	**94.00**	**118.00**	......	......	**148.00**	**140.00**	18.72	22.80
†	*90.00*	*100.00*	*103.25*	*99.25*	*97.50*	*97.50*	*120.00*	*122.50*	*120.00*	......	......	.....	.....
New York [2]	**109/114**	**112/117**	**110/115**	**115/120**	**120/125**	**125/130**	**150/160**	......	......	**210/240**	**210/240**	25.92*	31.60*
	......	......	*Range from $120.00 to $125.00*				*135/150*	*144/155*	*144/155*	......	......	.....	.....
New York **	**97.00**	**99.00**	**82.00**	**95.00**	**98.00**	**100.00**	**120.00**	......	......	**190.00**	**190.00**	....	...
	98.00	*98.00*	*110.00*	*109.00*	*109.00*	*110.00*	*115.00*	*125.00*	*125.00*	......	......	.....	.....
Philadelphia ‡			**Range from $114.00 to $127.00**				**114/127**	......	......	**200/210**	**200/210**	25.92*	31.60*
			Range from $125.00 to $150.00				*130/140*	*150.00*	*150.00*	......	......	.....	.....
Pittsburgh †			**Range from $90.00 to $95.00**			**110/120**	**110/120**	......	......	**100/120**	**115/125**	25.92*	31.60*
			Range from $110.00 to $120.00			*110/120*	*110/120*	*140/155*	*145/155*	......	......	.....	.....
St. Louis #	**c112.00e**	**114.00e**	**104.00d**	**108.00e**	**112.00e**	**118.00e**	......	......	......	......	......	18.72	22.80
	......	......	*114.00i*	*124.00e*	*124.00e*	*125.00e*	*200.00e*	*200.00*	*200.00*	......	......	.....	.....
San Francisco A†	*68.00*	*70.00*	*81.50*	*77.50*	*76.00*	*73.00*	*80.00*	*81.00*	*78.00*	......	......	12.22*a	14.91*a
Seattle †	*80.00g*	*80.00g*	*80.00g*	*80.00g*	*80.00g*	*80.00g*	*80.00g*	*80.00g*	*80.00g*	......	......	.....	.....

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots. 3. asd.

LUMBER: **Bold Face type, Southern Pine.** *Italics, Douglas Fir.* *a* Spruce *b* Tax exempt. *c* 5M lots. *d* 8-12 ft. lengths. *e* 8-16 ft. lengths. *f* 18 ft. or under. *g* No. 1 common. *i* 8 ft. lengths. *k* No. 3 common. *l* 8-10 ft. lengths. *n* ⅓ #1, ⅓ #2 & ⅓ #3.

A Rail freight rate from Northwest mills to San Francisco are $11.50 to $15.00 per M ft bm. From Northern Calif. mills $9.00 by rail, $9.50 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures.

PLYWOOD: Plyform grade Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface. Seattle base price on ⅝", $176.00; on ¾", $201.00. Exterior plyform ⅝" $196.00, ¾" $223.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. *a* Lower rate by water shipment. *b* 50,000 lb. minimum.

* Incl. new freight rates. Rates for other cities not avail. as we go to press.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS Discounts from jobbers list, Feb. 1, 1950*a* Single or Double Thickness		EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*
	A quality	B quality	
Atlanta	79%	80%	$0.2315
Baltimore	76%d	78%d	.2315
Birmingham	83%	83%	.1790
Boston	79-10%	79-10%	.2315
Chicago	78%	78%	.2315
Cincinnati	78%	78%	.2315
Cleveland	78-10-10%	78-10-10%	.2715
Dallas	75%	75%	.2390
Denver	81-5%	81-5%	.2365
Detroit	78-10-10%	78-10-10%	.2315
Kansas City	80-10%	80-10%	.2365
Los Angeles	75%	80%	.2340
Minneapolis	78-10%	78-10%	.2365
Montreal	40-5%bc	40-10-5%b	21.60hi
New Orleans	78%	77%	.2365
New York	82-10%	82-10%	.3975g
Philadelphia	78%	82%	.2315
Pittsburgh	82%	82%	.2040
St. Louis	80-10%	80-10%	.2365
San Francisco	70%	70%	.2315
Seattle	75%	78%	.2340

Price of 60% Ammonia Gelatin is $0.0125 per lb. higher than 40%

Glass; a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. *b* Discount from list, Apr. 1951; sales tax included, but 6% tax exemption not allowable for. *c* Single thickness. *d* Discount 6/15/52.

Explosives; * Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. *g* In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. *h* F.o.b. city per 100 lb. forcite, 40% Forcite 60%, $23.35. *i* F.o.b. Beloeil (near Montreal).

40% Ammonia Gelatin price ranges in other than urban areas, per lb.
(except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.179	$0.2115	$0.2315
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.184 - .1915	.2165- .224	.2365- .244
Rocky Mtn. States	.184 - .1965	.2165- .224	.2365- .249
Pacific N. W. States	.1815- .194	.214 - .2265	.234 - .2465
Pacific S. W. States	.179 - .1865	.2115- .214	.2315- .2365

PILES, TIES F. O. B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

			By Rail	
Dimensions	Points	Length	Pine*	Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.51	....
12-in.— 2-ft. from butt	6-in.	50 to 59-ft.	.54	....
12-in.— 2-ft. from butt	6-in.	60 to 69-ft.	.58	....
12-in.— 2-ft. from butt	6-in.	90 to 100-ft.	....	....
13-in.— 3-ft. from butt	5-in.	91 to 100-ft.	....	....
14-in.— 2-ft. from butt	6-in.	50 to 69-ft.	.50/.68	....
14-in.— 2-ft. from butt	6-in.	70 to 79-ft.	.78/.83	.93
14-in.— 2-ft. from butt	5-in.	80 to 85-ft.	.83/.93	.94
14-in.— 2-ft. from butt	5-in.	85 to 89-ft.	....	1.00
14-in.— 2-ft. from butt	5-in.	90 to 100-ft.	....	1.02

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b. per tie for carload lots:		6"x8"x8'		7"x9"x8'6"	
		Untr.	Tr.	Untr.	Tr.
Boston	Oak i	....	...	....	....
	Pine i	....	....	....	....
New York	S. L. Sap Pine	$2.55	$4.35	$3.45	$5.45
	Mixed Oak	3.10	4.65	3.70	5.95
Birmingham	Hardwood	2.40	3.88a	2.85	4.58a
Chicago	Red Oak	...	4.00a	....	5.00a
Los Angeles	Douglas Fir	....	....	....	....
	Redwood	....	....	....	....
Philadelphia	Red Oak	2.60	3.95	3.45	5.10
St. Louis	White Oak	3.04	...	3.85	....
	Red Oak	2.94	3.60a	3.67	4.68a
	Sap Pine or Cypress	3.41a	....	4.44	....
San Francisco	Douglas Fir	2.20e	3.25ef	2.92bf	4.30caf
Montreal	Birch or Maple	....h	....h	....h	....h

Tr.— Treated; Untr.— Untreated. *a* Creosoted. *b* 7" x 9" x 8'. *c* Empty cell. *e* Green. *f* F.o.b. cars. *h* No constant price available. *i* Not available.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb	$6.00
Chlorine cylinders, liquid, per lb. f.o.b. works	.0875
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, f.o.b. works, ton	25.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	2.20
Soda ash, 58%, in paper bags, per 100 lb. dense	1.60
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.65
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	8.95

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED Per M. lots of 2,000 pieces or over,			STRUCTURAL CLAY TILE — LOAD BEARING — SCORED Per M. lots of 2,000 pieces or over,			BRICK Per M. in quantity		LIME Per ton, In paper, Carload lot,		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Hydrated finishing	Common hydrated	Pulverized, or lump
Atlanta	$195.00	$207.50	$247.50	$327.00	$342.00	$381.50	$27.38	$27.38	$19.00	$17.50	$17.50
Baltimore	183.00	195.00	366.00	415.00	541.00	618.00	36.00k	41.00k	30.00	21.00	....
Birmingham	118.00p	128.00p	236.00p	283.00p	......	......	23.50ff	28.00gg	26.37	17.10	.
Boston	196.00†	209.00†	392.00†	383.25†	......	.....	34.50p	37.50p	30.00†	28.00†	. .
Chicago	135.00	145.00	280.00	.....	......	.....	23.00	25.00	30.80	26.00	....
Cincinnati	185.00j	195.00j	340.00jdd	......	......	......	34.50j	46.00j	26.37j	24.62j	.....
Cleveland	172.00**	183.00**	......	.....	......	......	32.00	32.00	25.50	23.50	31.00ee
Dallas	......	118.00	.....	......	. . .	. ...	19.75	35.25	32.00	21.80	.....
Denver	......	......	......	......	......	......	34.00	40.00	34.80bb	28.00bb	34.00bb
Detroit	127.75	136.25	255.55	......	317.25	362.60	34.90cc	33.30cc	32.00	30.00	.....
Kansas City	115.50	122.50	245.00	245.00	303.50	367.00	26.00	26.00	30.50	24.50	27.00
Los Angeles	r	r	r	r	r	r	24.50§	.....	34.24	34.24	35.24
Minneapolis	171.50p	192.50p	386.00p	192.50wn	......	......	32.00vp	36.00	38.00bbe	28.00bbe	40.00bbde
Montreal	150.00aq	162.50au	300.00au	......	.....	......	31.00	41.50	34.80	32.50	24.60u
New Orleans	170.00	170.00	310.00	380.00	......	......	31.00	.....	.....	28.00	28.00
New York	138.70h	147.90h	203.40ch	221.90hn	......	......	35.00	.....	36.00	32.00	.....
Philadelphia	126.30	134.80	252.60	302.74	361.35	......	32.00	42.00	25.00	23.00	2.97
Pittsburgh	112.00	117.00	189.00	216.00	279.00	317.00	36.00	46.00y	25.00	23.00	2.97m
St. Louis	138.00cc	158.50cc	313.00cc	......	351.00cc	......	40.00sl	36.00s	.85saa	.65saa	1.10aaspee
San Francisco	156.85a*	177.10a*	235.30dda*	......	......	......	37.00	......	26.60	26.60	2.65m
Seattle	175.00cc	190.00cc	......	190.00ccw	......	......	39.00s	49.00s	37.50shh	1.45‡	3.90mhh

† F.o.b. yard Roxbury. *a* Smooth. *b* Per 50 lb. bags. *c* 6 x 12 x 12 in.-3 cell. *d* Pulverized bot. *e* 5%, 10th following month. *g* 5⅓ x 8 x 12. *h* F.o.b. trucks, job site N.Y.C. *j* Truck load or over. *k* $1.00 discount *l* Red face. *m* Per bbl., 180 lb. *n* 7⅓ x 7⅓ x 12. Speed title. *p* Truck lots. *q* Provincial and Municipal tax extra. *r* Not used because of earthquake danger. *s* 2% discount for cash. *t* 5⅓ x 8 x 11⅓. *u* Tax exempt. *v* Sand lime. *w* 5 x 8 x 12. *y* Stacked. *z* Pebble lime price per 80 lb. sack. *aa* Price per sack. Lime not sold per ton. *bb* LCL. *cc* Truck delivery. *dd* 6 x 12 x 12. *ee* Pebble lime. *ff* 80% common. *gg* Select. *hh* LCL. § F.o.b. yard. ‡ Per 60 lb. sack, no incr., ton price no longer quoted. ** Warehouse delivery. * F.o.b. Stockton.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl.	WHITE LEAD Per 100 lb. in 100 lb. cases	READY-MIXED PAINT Per gal., drums			ROOFING SUPPLIES Carload lots f.o.b. factory				
	Dry a	in oil w	Graphite b	Aluminum c	Ferric Oxide d	Rolls, slate surfaced, 85–90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 360 lb. bbl. per ton
Atlanta	$19.00	$30.125	$1.75	$2.70	$1.65	$2.06‡	$2.06‡	$2.06‡	$1.00‡	$36.00‡
Baltimore	18.75	29.75	2.65	4.10	3.22	2.50	4.17	4.17	.42	37.00
Birmingham	19.00	30.125	3.90	3.40	....	2.80	2.75	2.75	....	40.50ee
Boston	18.75	29.75	....	...	....	2.67gg	2.79og	2.79og	.42g	42.00g
Chicago	18.75	29.75	....	. .	...	2.73‡u	3.04‡o	3.04‡o	38.00‡bbr	43.00‡
Cincinnati	18.75	29.75	..	....	....	2.50	2.50	2.50	.42y	42.36
Cleveland	18.75	29.75	2.65pggA	2.95ggB	2.50ggC	2.50q	2.50o	2.50o	.39y	43.20hh
Dallas	19.00	30.50	....	4.05	....	3.50q	3.75o	4.35o	.36	46.00
Denver	19.25	30.25	3.07	5.15	2.87	3.25o	2.40o	2.40o	.43ff	42.00
Detroit	18.75	29.75	2.35	3.40	2.50	2.75	2.50f	2.50	.51	40.00
Kansas City	18.75	29.87	....	2.71ys	2.65	2.50	2.50o	2.50o	.313s	48.00
Los Angeles	18.75	30.00	3.30n	4.50n	4.20n	2.97n	2.01en	l	.44n	l
Minneapolis	18.75	28.95/29.87	....	....	....	2.40idd	2.50hidd	2.50hidd	.36idd	37.00r
Montreal	.....	20.70	2.95Dff	4.05Eff	3.35Fff	4.82f	3.65tf	3.65tf	1.24kf	3.78kt
New York	18.75	29.75	....	....	....	2.50	2.50c	2.50o	.36z	37.00*
Philadelphia	18.75	29.75	3.25	3.65	3.15	2.54	2.94	2.94	.37	26.00
Pittsburgh	18.75	29.75	2.65	2.65	3.15	2.50	2.87o	2.87o	.40	42.00
St. Louis	18.75	29.75	....	....	....	2.50	2.50h	2.50h	.33y	38.00
San Francisco	18.75	30.00	2.40	....	3.40	2.95	4.00aa	....	.49	.....
Seattle	18.75	30.25	2.96m	2.80m	....	3.58mgcc	3.05hmcc	....	.59mcc	52.00jmc

‡ Delivered. Note: Red lead in oil 50c higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3-49A. *c* ASTM Spec. D266–31. *d* 80% minimum ferric oxide. *e* 15 lb. *f* Per 432 sq. ft. *g* F.o.b. yard, Roxbury. *h* Per roll. 65 lb. *i* Net carload lot prices; Minneapolis and vicinity. *j* Asphalt pitch. *k* Per cwt. *l* Not used. *m* 1% discount for cash. *n* F.o.b. city. *o* Per 60-lb. *p* 6-drum. *q* Per 90-lb. roll. *r* F.o.b. factory Chicago. *s* 466 Med. *t* Federal tax included. *u* Per 90 lb. square. *v* Per ton. *w* Price to large paint contractors is $1.25 less. *x* Mineral surfaced. *y* 55-gallon container. *z* Drums. *aa* Approximate cost per 100 lbs. *bc* Roofers coating and cement. Price per ton. *cc* LCL, truck delivery. *dd* 2% cash discount. *ee* Asphalt. in 100 lb. package. *ff* 5-gal. drums. *gg* F.o.b. factory. *hh* Incl. freight. *A*. TTP 27. *B*. TTA 468A. *C*. TTP 31A. *D*. Std Black. *E* Ready-mixed, *F*. Over 80% ferric oxide. * Aver. wt. approx. 500 lbs

SKILLED AND COMMON WAGE RATES—PER HOUR

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Common Labor Building	Common Labor Heavy Const.
Atlanta	$2.75	$2.20	$2.60	$2.25	$2.75	$2.60	$2.75	$1.05	$1.05
Baltimore	3.20v	2.58	3.125t	2.85/3.00	2.75	2.75	2.80	1.565t	1.565t
Birmingham	3.00	2.24	2.50	2.16	2.52	2.75	2.65	1.225	1.325
Boston	3.06a	2.625	2.82	3.00	3.05	2.80	2.90d	1.99n	1.99n
Chicago	3.25k	2.95	3.05w	2.80	3.43g	3.212f	3.09e	2.20m	2.20m
Cincinnati	3.12	2.625	2.815	2/2.50/3.05	2.90	2.90	2.90	1.92	1.92
Cleveland	3.12	3.075‡	3.075	3.75	3.075	3.075	3.00	2.325	2.325
Dallas	3.4375	2.4875	2.625	2.50	3.437	2.75	2.7625	1.325	1.35
Denver	3.45	2.35w	2.50	2.48w	3.30w	2.90	2.82	1.575	1.575
Detroit	3.13	2.88	3.13m	2.90	3.25l	3.05	3.00s	2.13	2.13
Kansas City	3.50	2.55	2.68	2.515/2.76	3.175	2.70	2.75	1.88s	1.88s
Los Angeles	3.175	2.57	2.70	2.44	3.437w	2.75	2.90	1.94	1.94
Minneapolis	3.05	2.55	2.57	2.35	2.90	2.71n	2.70	1.82	1.82
New Orleans	2.85	2.22	2.65	2.50	2.525	2.65	2.675	1.225	1.225
New York	3.85br	3.24bo	3.50o	3.50o	3.95A	3.75as	3.445bps	2.05	2.05
Philadelphia	3.46i	2.90	3.32j	2.90vw	3.325h	3.298u	3.29y	1.75	2.05
Pittsburgh	3.25	2.75	2.75	2.825	3.15	2.75	2.80	1.90	1.90
St. Louis	3.55c	2.90h	2.90	2.97s	3.00	3.09c	2.75	1.97s	1.97s
San Francisco	3.25b	2.60	2.85z	2.56	3.125s	3.00	2.75	1.85	1.85
Seattle	3.30	2.58	2.78	2.71	3.15	2.80	2.75	2.18	2.14
Montreal*†	1.90	1.70	1.80	1.60	1.90	1.80	1.85	1.20	1.20

a 6 hr. day. *b* 7 hr. day. *c* Incl. 3% vacation stamp fund for bricklayers; 4% for electricans plus 7¼ W.F. *d* Incl. 10¢ H. & W. F. *e* Incl 6¢ H. & W. F. *f* Incl. 6% W. F. *g* Incl. 11½¢ W. F.. * Cost of living bonus now included in basic wage. ‡ Includes 5¢ per hr. tool replacement. *h* $2.45 homes and housing + 5¢ vacation fund. *i* Incl. 3½% welfare. *j* Incl. 9¢/hr. welfare. *k* Incl. 7½¢/hr. welfare fund. *l* Incl. 4% vacation fund. *m* Incl. 5¢/hr. welfare ins. fund. *n* Incl. 6¢/hr. welfare fund. *o* Incl. 3% welfare fund. *p* Incl. 5% welfare fund and 3% pension fund. *r* Incl. 3% welfare fund and 20¢ pension fund. *s* Incl. 5% welfare and pension fund and 4% vacation fund. *t* Incl. 7½¢ W. & H. F. *u* Incl. 1½% welfare fund. *v* Incl. 10¢ welfare fund. *w* Negotiating. *z* Await WSB appr *y* Incl. 8% W. F. *z* Incl. 7½¢ I F, 5¢ H. & W. F. *A* Incl. 10¢ W. F., 10¢ P. F. & 10¢ Vac. F. † Plus 2% vacation pay.

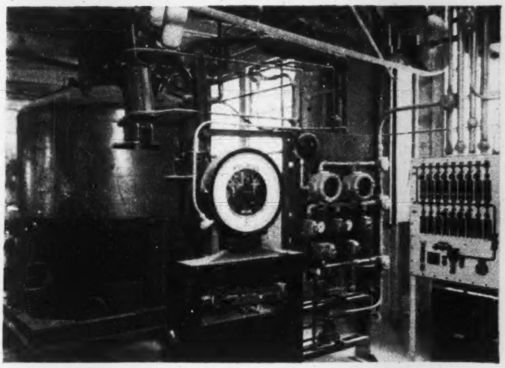
MEXICO CITY PRICES

In Pesos, F.o.b. City		July'52	Aug'52
Common Wages—Building			
(8 hr. day)	av. per hr.	.83*	.83*
Common Wages—Heavy			
Const. (8 hr. day)	av. per hr.	.93*	.93*
Skilled Labor Wages			
Carpenters (8 hr. day)	av. per hr.	2.25*	2.25*
Bricklayers (8 hr. day)	av. per hr.	2.25*	2.25*
Struct. Iron Workers (8 hr. day)	av. per hr.	1.50*	1.50*
Struct. Steel Shapes			
3"-15" x 12 meters	per metric ton	1,193.63	1193.63
Reinf. Steel. Corr. Rods			
¼" x 11 meters	per ton	1,356.17	1356.17
⅜" x 11 meters	per ton	1,344.96	1344.96
½" x 11 meters	per ton	1,333.75	1333.75
⅝" x 11 meters	per ton	1,322.54	1322.54
¾" x 11 meters	per ton	1,322.54	1322.54
1" x 11 meters	per ton	1,322.54	1322.54
Gravel truck load of 3½ cu. meters			
Blue Gravel	per tr. load	55.00	50.00
Rose Gravel	per tr. load	45.00	47.00
Cement, Std. Port. (Tolteca)	per ton	160.00	160.00
Lumber			
Mex. Sacred Fir (OYAMEL)	per M ft.	850.00	850.00
1st Class Pine	per M ft.	1400.00	1400.00
2nd Class Pine	per M ft.	1100.00	1100.00

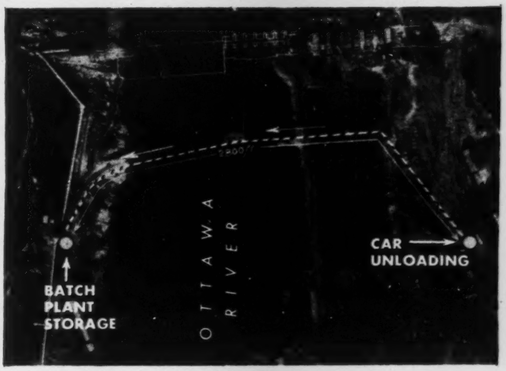
* Increase by 1/6th—work 6 days, paid for 7 days.

ENR Skilled Average: (Bricklayers, Carpenters, Ironworkers): $2.909 **ENR Common Average:** $1.803

Robinson *Air-Activated* **Conveyor**



This Activator, heart of the Robinson Air-Activated Conveyor System, handling various grades of flour. The materials are continuously conveyed, automatically weighed and recorded.



Site of a big dam job where a Robinson Air-Activated Conveyor is moving bulk cement from siding to mixing plant almost 3,000 feet away at a total cost of only 15 cents a ton.

Serve Many Industries

Conveying Pneumatically Dry Pulverized and Granular Materials is Bulk, such as:

CONSTRUCTION—conveying bulk cement from rail cars to storage or batch plant, often over long distances and to high elevations.

CHEMICALS—conveying ammonium nitrate, soda ash, plastic resins, alum, arsenic, phthalic anhydride.

FOUNDRIES—conveying molding sand, Bentonite, sea coal, with completely automatic operations.

FOOD PROCESSING—handling salt, starch, sugar, flour.

GLASS PLANTS—conveying silica, dolomite, feldspar, flint, soda ash, silex.

RUBBER PLANTS—handling carbon black, stearic acid, clays.

FLOUR MILLS—handling flour, grits, meal.

SUGAR REFINERIES—handling bulk granulated and bulk powdered sugar, activated carbon.

Handles Difficult Materials:

(such as)

abrasive, corrosive, friable, high temperature, explosive, pyroforic, poisonous

And conveys all these in completely closed, dust-tight systems using only low volume air. Power and operating costs are low and maintenance is negligible.

If you are working on a project calling for the transfer in bulk of dry-pulverized or fine granular materials, look into the Robinson Conveyor. It has several outstanding advantages, not the least of which is *economy*.

ROBINSON *Air-Activated* **CONVEYOR SYSTEMS**

A Division of
MORSE BOULGER DESTRUCTOR CO.

Telephone — ORegon 9-4949

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BUSINESS AND FINANCE

1952 contracts headed for all-time record

August contract awards, as reported by Engineering News-Record, hit $2.2 billion—the second highest month on record.

The record was set in July of this year when volume shot up to $2.3 billion.

This month's high volume was due largely to a $1.2-billion contract for construction of an Atomic Energy Commission gaseous diffusion plant in Ohio.

Construction volume is now a sure bet to reach a new record in 1952. Total contracts stood at $11.3 billion at the end of August, 15% above the comparable 1951 period.

Public construction, especially building-other-than-housing and highway construction has been responsible for the good showing this year, although private housing has also been an important factor.

Public buildings, other-than-housing, registered $1,410 million in new contracts, including AEC work, this month, to bring the total for the year to $3,552 million. This is an increase of 126% over 1951.

Highway contracts added $125 million in August, bringing the 1952 total up to $1,055 million for a 31% gain over last year. Bridge construction, closely allied to highway volume, is riding at a high rate with $247 million for the year to date, 17% above last year.

- **Industrial building gains**—Private construction saw industrial building coming back strong this month with $233 million, after hitting a low for the year of $158 million in July.

The big item here was a $120-million contract for power plants to supply the new AEC project in Ohio.

Private mass housing dropped to $206 million for the month. But the total for the year to date is $2,043 million, 53% more than last year.

The Middle West led this month in contract awards with a $1,456-million total. This was mainly the result of the AEC projects. This region had the largest volume of highway contracts—$33 million.

The South was second highest on the basis of $207 million in new contracts. Again, this was due to the high volume of public building construction other-than-housing.

Middle Atlantic was third with nearly $198 million of which private mass housing took $82 million.

PHA to market $170 million in bonds

Seventy-nine local housing authorities in 23 states will open bids Sept. 23 for $170.7 million in bonds, the Public Housing Administration announced last week.

To a large extent, the Sept. 23 marketing is the same package that was announced several months ago (ENR Apr. 3, p. 39) when the Public Housing Administration announced a $167-million sale scheduled for Apr. 15.

The mid-April bond sale was canceled when PHA read the fine print in a rider attached by the House to an independent offices appropriations bill.

The rider prohibited annual contributions to local housing authorities "which allow occupancy by any person belonging to an organization declared subversive by the Attorney General."

Obviously unprepared to police the actions of all local housing authorities in the nation, PHA feared that the rider would remove the most important factor—government support—from the local housing bond issues. The PHA, therefore, canceled the bond issue.

Under present law, the Public Housing Administration must see to it that the local agencies meet their obligations, even if federal contributions are necessary.

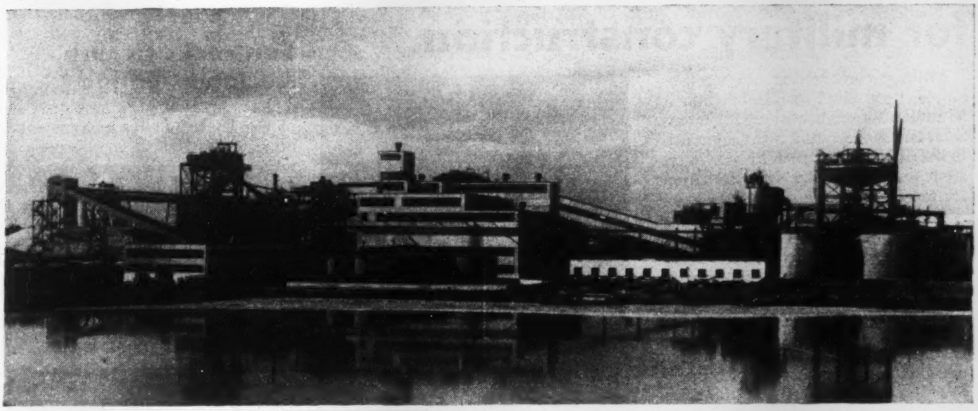
The Senate later knocked out this rider.

ENGINEERING CONSTRUCTION CONTRACTS—AUGUST, 1952

Engineering News-Record *reports continental U. S. Construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigation,* $34,000; *other public works,* $60,000; *industrial buildings,* $82,000; *other buildings,* $300,000

Four Weeks—Thousands of Dollars (000 Omitted)

	August, 1952							U. S. Cumulative Eight Months		%	Canada
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	1952	1951	Change '51 to '52	August 1952
Public Works											
Waterworks	1,356	1,094	2,342	954	7,542	2,816	**16,104**	**155,402**	150,029	+ 4	1,786
Sewerage	976	6,132	3,599	5,388	8,162	7,963	**32,220**	**197,796**	214,201	− 8	1,774
Bridges	1,738	10,911	2,557	5,582	2,261	1,634	**24,683**	**247,193**	211,125	+17	406
Earthwork and waterways	520	1,777	322	2,311	7,064	11,051	**23,045**	**347,729**	354,033	− 2	2,314
Streets and roads	5,614	22,901	27,790	32,554	26,463	10,154	**125,476**	**1,054,690**	807,514	+31	1,897
Public buildings, residential	....	3,191	....	1,171	....	885	**5,247**	**488,951**	551,660	−11	3,064
Other public buildings	4,962	29,758	80,807	1,226,240	20,567	47,845	**1,410,179**	**3,552,059**	1,572,584	+126	8,585
Unclassified	4,156	12,421	19,137	1,848	12,042	20,583	**70,187**	**571,475**	757,442	−25	5,929
Total public	**19,322**	**88,185**	**136,554**	**1,276,048**	**84,101**	**102,931**	**1,707,141**	**6,615,295**	**4,618,588**	**+43**	**25,755**
Federal government (included in above classifications)	4,838	27,903	82,308	1,213,557	20,481	63,905	**1,412,992**	**3,732,696**	1,769,616	+110	10,307
Private											
Bridges	....	....	....	....	....	....	....	**14,520**	11,577	+25	....
Industrial buildings	1,032	16,168	30,628	137,877	32,057	15,008	**232,770**	**1,890,305**	2,876,475	−34	7,839
Com'l. buildings, residential	2,415	82,172	31,646	27,115	44,302	18,611	**206,261**	**2,042,604**	1,334,319	+53	15,755
Other commercial buildings	4,654	9,593	3,913	9,617	8,049	1,785	**37,611**	**411,094**	465,032	−12	3,650
Unclassified	....	1,700	4,039	5,537	11,100	4,413	**26,789**	**329,972**	501,293	−34	4,501
Total private	**8,101**	**109,633**	**70,226**	**180,146**	**95,508**	**39,817**	**503,431**	**4,688,495**	**5,188,696**	**−10**	**31,745**
Total Engineering Construction:											
August, 1952—4 weeks	**27,423**	**197,818**	**206,780**	**1,456,194**	**179,609**	142,748	**2,210,572**	....	....	....	**57,500**
July, 1952—5 weeks	67,346	252,466	1,262,116	211,892	333,397	183,307	**2,310,504**	....	....	....	96,580
August, 1951—5 weeks	59,472	294,182	215,774	155,626	231,430	189,231	**1,145,715**	....	....	....	155,104
Eight Months—1952	**403,753**	**1,728,572**	**2,932,676**	**2,715,324**	**2,382,322**	**1,141,143**	....	**11,303,790**	....	**+15**	**771,119**
Eight Months—1951	463,060	1,850,318	2,072,215	1,724,859	2,300,615	1,396,217	....	....	9,807,284	....	822,629
% Change '51 to '52	−13	−7	+42	+57	+4	−18	....	....	....	....	−6



INCREASING DEMAND FOR CHEMICALS is bringing a boom in this type of construction. Typical of the plants going up in this program is this phosphate plant at the Noralyn Mine, near Bartow, Fla.

Peace, war needs spur chemicals expansion

The chemical industry is increasing its capacity—which by 1955 will be about 50% over January, 1951, output—and the expansion spells out some good business ahead for the construction industry.

The Korean War is partly responsible for the construction boom in chemicals. But chemicals are also basic to civilian economy and there is no borderline between what is a military and what is a civilian chemical.

A recent list of certificates of necessity for chemical expansion, fairly typical, illustrates the point:

California Refining Co., Perth Amboy, N. J., gasoline, $140,000; Pittsburgh Steel Co., Monessen, Pa., metallurgical coke & coal chemicals, $11.2 million; Virginia-Carolina Chemical Corp., Nichols, Fla., cryolite, $474,000; United States Steel Co., Lorain, Ohio, metallurgical coke, $6.3 million; Huron Portland Cement Co., Superior, Wis., portland cement, $690,210; Phillips Petroleum Co., Sweeney, Tex., petroleum refining, $185,500; Phillips Petroleum Co., Brazoria County, Tex., butanes, $330,000; Phillips Petroleum Co., Phillips, Tex., aviation alkylate, $453,860; Ozark-Mahoning Defense Co., Deming, N. Mex., acid grade fluorspar, $589,836; Proven Oil & Refining Co., Florence, Ariz., petroleum refining, $7.5 million.

Next to steel, the chemical industry has the largest expansion under way of any basic industry. New construction under way or planned is estimated to cost $1.5 billion. The 1952 expansion alone will boost chemical output 12%.

Much of this construction is being aided through rapid amortization certificates.

The Defense Production Administration has set goals for 1955 for 43 chemicals. Included are eight coal-tar derivative chemicals, nine other organic chemicals, five solvents, 11 inorganics, four agricultural chemicals, as well as oxygen, vulcanized fiber, carbon black, activated carbon, plastic materials and penicillin.

- **$100-million plans**—There are some spectacular individual expansion plans. One example is the Dow Chemical Co. Several weeks ago, Dow received a loan of $100 million, making more than a quarter of a billion dollars borrowed within the past 12 months to help pay for Dow expansion projects over the next four years.

Dow now holds certificates of necessity for a total of $300-million worth of new plant construction. Nearly half of this has been started. Expansion of the firm's two plants in Texas accounts for approximately half of the total.

One segment of the chemical industry—petrochemicals—is growing even faster than its galloping parent, oil.

The 1952 construction expansion by the eight top firms in this field is estimated at more than $300 million. The top four are: DuPont, $100 million; Dow Chemical, $75 million; Monsanto, $55 million, and Union Carbide & Carbon, $50 million.

Other segments of the industry are also booming, such as antibiotics, plastics, pesticides, synthetic fibers, and vinyl resins.

There is a feeling that most of the chemical industry expansion would have been made necessary by increasing demand even if Korea had not come along.

Few chemical firms have definitely decided that the end of their expansion is in sight, and either through internal financing or through bank loans are still putting money into more plants.

Purchasing centers switched by Army

The Army Corps of Engineers has given the Pittsburgh district responsibility for purchasing structural steel beams, metal bars, plates and shapes, pipe, barbed wire and tubing formerly purchased by the St. Louis district. The St. Louis district has been discontinued as a purchasing center for major end items of construction material. It will now be established as a lumber procurement office.

Meanwhile, the Chicago office will no longer buy lumber. It will now be responsible for purchase of asphalt, cement, roofing and building fixtures and construction equipment.

Creedon named to key post for military construction

Military construction last week acquired a top hand to ride herd on its $3-billion annual business. Defense Secretary Robert A. Lovett appointed Frank R. Creedon to fill a newly created post as Director of Installations for the department.

Creedon for the last 20 months has headed the Facilities and Construction Bureau of the National Production Authority. Before that, he was construction manager for General Electric on design and construction of the Hanford Works for the Atomic Energy Commission. Earlier, he had done the same sort of job for Stone & Webster on the Oak Ridge atomic energy plant, and in between had served a year and a half as federal housing expediter.

With this background, plus World War II experience directing ordnance and chemical warfare construction and serving as deputy director of the synthetic rubber program, Creedon has the qualifications that Congress set up for the new post. Construction men generally agree that he will be able to do a job for the Defense Department.

In mulling over the recent authorization bill for military public works, Congress decided that the Secretary of Defense needed better information and close control of the department's far-flung construction operations. The Senate wrote into the bill, with the House concurring, a requirement that the secretary "maintain direct surveillance over the planning and construction by the military departments of all public works projects."

• **Watchdog**—To help him with that broad task, Congress empowered him to appoint a civilian director of installations who would be directly responsible to the secretary and would receive $14,800 a year.

The installations director, the bill said, shall keep the secretary currently and fully informed on the status, progress and cost of public works projects. No one was to be appointed until the secretary was satisfied that he had a man with substantial experience in the construction of public works such as the military build.

On the House floor, Armed Services Chairman Carl Vinson made it clear that the new office was not intended to mushroom into a large agency. As Senate conferees had explained it to him, the director of installations would use a very small staff of people having construction capabilities and experience.

FRANK R. CREEDON takes over as boss of military construction.

In his new post, Creedon can exert considerable influence over military construction programs, from preliminary planning to completion. The Secretary of Defense will depend on Creedon for a large part of his advice on construction matters.

• **Wide scope**—Language of the law is broad enough to include all public works activities of the military departments. Whether Creedon will have responsibility for surveillance of civil works performed by the Army Engineers is not yet known. In times like the present, he would have a direct interest in the civil works because of their bearing on military construction progress.

Tight steel supplies lend added importance to the job at this time. Coming from NPA, where he sat in the driver's seat on allocations for industrial and commercial projects, Creedon now moves over to the other side of the fence on military construction.

The military services have been assured steel to meet their full requirements in the current quarter and the fourth quarter of this year. With his recent experience, Creedon's eyes will be sharp to see whether the military use all the steel allotted to them. And, if they don't, he should be equally keen to have the unused portion turned back to NPA for civilian use.

Suit seeks to curb Reclamation job

The question of whether an agent of the United States government can obligate the U. S. beyond express limitations set by Congress is involved in a suit brought by the U. S. District Attorney for California against the Coachella Valley County Water District.

At stake is some $4 million over and above an original contract price of $13.5 million required to complete a portion of the All-American Canal for distribution of Colorado River water in Coachella Valley.

The water district maintains that the Bureau of Reclamation undertook to complete the project at a $13.5-million cost to the district, and that the district is not obligated to pay any amount above that figure. Government case is that congressional legislation on reclamation projects calls for complete reimbursement to the government of funds spent for construction. Thus, even if the contract would normally relieve the district of further obligation, the question is: Since assumption by the government of the remainder of the cost would violate the fully reimbursable provision of Congress, is the contract (in the name of the Secretary of Interior) binding?

Congress has passed necessary appropriations above the original figure, with the proviso that before the project is turned over to the district, the district will have to reimburse the additional funds unless the contract is determined by the courts to be binding at the original figure.

Congress ordered the Attorney General to bring suit to get a declaratory judgment.

The district is of the opinion that exceeding the contract price was unnecessary.

Money goes a long way

Money used in weekly payroll for the 20,000 workers at the Atomic Energy Commission's project near Paducah, Ky., is spread over an area with a diameter of 187 miles, according to F. H. McGraw Co., prime contractor. A recent survey showed the majority of workers live in small towns in four states—Kentucky, Illinois, Tennessee, and Missouri—with some of them traveling as far as 222 miles to and from the AEC site.

Wages, lumber prices nudge costs up

ENGINEERING NEWS-RECORD'S construction cost index moved up to 586.47 (1913 equals 100) this month, for a 0.5% increase over August and an 8% rise since September, 1951.

ENR's building cost index this month stood at 424.79 (1913 equals 100), representing a 0.6% rise over August and a 6.1% climb since September of last year.

Skilled wages, ENR's 20-cities average for three key trades, was $2.909 per hour. This was a 0.8% rise over the $2.885 hourly rate for August and is 7.7% higher than a year ago.

Average rates for structural ironworkers, carpenters and bricklayers all were higher this month.

Common labor rates in building and heavy construction average $1.803 per hour this month. This was a gain of 0.5% over the $1.793 average of last month. Common labor rates this month were 10.1% higher than they were in September, 1951.

Lumber prices moved higher this month. The 20-cities average for pine 2x4's rose to $93.066 per mftbm, a 0.5% gain over August.

Fir 2x4's stood at $110.083 per mftbm, a slight increase over last month.

There was no change this month in cement prices.

- **Costs up in nine cities**—Higher construction costs were reported in September in nine cities. Most of the increases were due to higher wage rates.

In three of the cities, increased lumber prices were responsible for the boost in costs.

Lower lumber prices resulted in a drop in costs for two cities—Baltimore and Cleveland.

Here is the city-by-city report on wage and price changes.

Baltimore: pine 2x4's down $3.00 to $75 per mftbm. Fir 2x4's up $1.50 to $109.50.

Birmingham: bricklayers received a wage boost of 25 cents an hour to push the rate to $3.00 a hour.

Chicago: structural ironworkers received a 20-cent-per-hour boost to $3.05 an hour. The raise included 5 cents-per-hour for the union's welfare fund.

Cleveland: fir 2x4's dropped $3.00 to $107 per mftbm. No change in the price of pine.

Denver: bricklayers raised 45 cents to $3.45 an hour.

Detroit: bricklayers and structural ironworkers received a 5-cent-an-hour increase to raise the rate to $3.13 per hour. Carpenters moved up 5 cents to $2.88 an hour.

Minneapolis: bricklayers up 15 cents to $3.05 an hour. Carpenters also won a 15-cent raise to $2.55 an hour.

New Orleans: structural ironworkers won a 5¢ increase to $2.65 an hour.

New York: pine 2x4's went up $5 to $112.50 per mftbm. Fir prices did not change.

St. Louis: pine rose $6 to $105 per mftbm while fir 2x4's dropped $2 to $115.75 per mftbm.

San Francisco: fir 2x4's were up $2.50 per mftbm to $81.50.

Seattle: fir went up $2.50 to $80 per mftbm.

ENR's August indexes revised on basis of official price increase for structural steel.

ENR cost indexes

1913 = 100

Construction cost

City	1952 Sept.	1952 Aug.	1951 Sept.
Atlanta	**402**	402	395
Baltimore	**530**	531	482
Birmingham	**450**	450	416
Boston	**630**	630	590
Chicago	**661**	661	620
Cincinnati	**612**	612	543
Cleveland	**684**	686	603
Dallas	**455**	455	437
Denver	**577**	577	564
Detroit	**656**	646	601
Kansas City	**623**	623	586
Los Angeles	**610**	610	558
Minneapolis	**628**	598	587
Montreal	**512**	512	484
New Orleans	**466**	466	434
New York	**655**	653	609
Philadelphia	**636**	636	582
Pittsburgh	**607**	607	551
St. Louis	**636**	626	584
San Francisco	**573**	570	525
Seattle	**635**	632	593

Building cost

City	1952 Sept.	1952 Aug.	1951 Sept.
Atlanta	**364**	364	339
Baltimore	**420**	421	398
Birmingham	**372**	366	351
Boston	**426**	426	412
Chicago	**432**	428	403
Cincinnati	**423**	423	395
Cleveland	**431**	432	398
Dallas	**382**	382	371
Denver	**452**	441	423
Detroit	**439**	435	410
Kansas City	**446**	446	417
Los Angeles	**415**	415	381
Minneapolis	**450**	443	423
Montreal	**396**	396	385
New Orleans	**397**	396	377
New York	**487**	484	457
Philadelphia	**477**	477	456
Pittsburgh	**427**	427	405
St. Louis	**455**	445	422
San Francisco	**401**	398	376
Seattle	**400**	397	389

* 3-day week due to early closing.

** 4-day week.

Activity This Week

As reported to ENR
(in millions of dollars)

Contracts by type of work

	This Week*	Cumulative 36 wks. 1952	Cumulative 36 wks. 1951	% chge
Waterworks	$3.9	$159.3	$153.8	+4
Sewerage	4.3	202.1	220.7	−8
Bridges	6.9	268.5	229.4	+17
Highways	14.3	1,069.0	842.3	+27
Earthwork, waterways	0.9	348.7	372.0	−6
Buildings:				
Public	12.5	3,564.6	1,594.0	+124
Housg., pub.	2.2	491.1	551.6	−11
Housg., priv.	24.1	2,066.7	1,350.7	+53
Commercial	8.9	420.0	473.1	−11
Industrial	17.7	1,908.0	2,910.7	−34
Unclassified	14.2	915.7	1,269.4	−28
Total	**$109.9**	**$11,413.7**	**$9,967.7**	**+15**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR indexes		1913	1926	1949
		Base Year = 100		
Constr. cost	Sept.	586.47	281.92	122.94
	Aug.	583.69	280.58	122.36
Bldg. cost	Sept.	424.79	229.63	120.75
	Aug.	422.36	228.32	120.06
Volume	Aug.	1,082	440	313

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In checking over our ever increasing customer list, we find that these contractors buy Viber Vibrators steadily year after year. This repeat business is indicative of the high regard contractors hold for the Viber line.

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VIBER COMPANY
Concrete Vibrators Since 1931
726 SOUTH FLOWER STREET
BURBANK, CALIFORNIA
Dept. 53

OFFICIAL PROPOSALS

Bids: September 18, 1952

Soil Explorations—SM-44

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Eastern Daylight Saving Time, on September 18, 1952 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE NEW YORK STATE THRUWAY, MOHAWK SECTION, SUBDIVISIONS 1 AND 2, MONTGOMERY COUNTY LINE TO WESTERN AVENUE, AND CATSKILL SECTION, SUBDIVISION 5, STYLEBARRCK ROAD, ALBANY AND SCHENECTADY COUNTIES, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-44.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.

(b) G. L. Nickerson, District Engineer, 353 Broadway, Albany, New York.

(c) Charles Schaefer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $24,200.00.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1210.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

B. D. TALLAMY
Superintendent of Public Works

Bids: September 11, 1952

Water Plant Equipment

Sealed bids will be received until 10:00 A.M. EST September 11 A.D., 1952, in the City Commission Room, Fort Lauderdale, Florida for Water Plant Equipment.

Bidding blanks may be obtained from the office of the Engineer. Plans and specifications are on file in the office of the Engineer.

A deposit of $15.00 for plans and specifications, and of $15.00 each for additional copies of plans or specifications, will be required. All deposits for plans and specifications will be refunded upon their return in good condition within ten (10) days of the opening of bids.

A certified check for 2% of the total amount of the bid, made payable to City of Fort Lauderdale, Florida, shall accompany each proposal as evidence of good faith and responsibility of the bidder. This check shall be retained by the payee as liquidated damages should the bidder refuse or fail to enter into a contract with the payee for the execution of the work embraced in the proposal, in the event the proposal of the bidder is accepted.

The Owner reserves the right to reject any or all bids.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-3785) will be received at Denver, Colorado, until September 23, 1952, for furnishing three 48-foot by 15-foot crest gates, including hoists, pumps and controls for Savage Rapids Diversion Dam, Grants Pass Project, Oregon. Delivery is desired within 480 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

(Continued on following pages)

OFFICIAL PROPOSALS

Bids: September 16, 1952

Dredging in Newark Bay & City Channel

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
CONTRACT PN-200.044

Sealed proposals for dredging in Newark Bay and the City Channel in connection with the construction of a wharf at Port Newark will be received at the office of the Chief Engineer of the Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 2:45 P.M. Tuesday, September 16, 1952, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials, Room 1110, and copies will be furnished upon deposit of $25 per set. Deposit to be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt should then be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, September 4, 1952

Bids: September 16, 1952

Lincoln Tunnel—Third Tube

THE PORT OF NEW YORK AUTHORITY
RIVER BORINGS
CONTRACT LT-160.004

Sealed proposals for making river borings for the Third Tube of the Lincoln Tunnel will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 2:30 P.M. Tuesday, September 16, 1952, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials, Room 1110, and copies will be furnished upon deposit of $25 per set. Deposit to be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt should then be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, September 4, 1952.

Bids: October 7, 1952

Housing Project

The Housing Authority of the City of Los Angeles, California, will receive sealed bids from financially qualified bidders for the construction of 964 units of a 1110 dwelling unit permanent Low-Rent Housing Project, known as Imperial-Compton, Cal 4-13. Bids to be opened at 2:15 P.M., Pacific Standard Time on October 7, 1952.

Bids will also be received for the construction of a complete 200 dwelling unit permanent Low-Rent Housing Project, known as Estrada Courts, Cal 4-20. Bids will be opened at 2:15 P.M., Daylight Saving Time (1:15 P.M., Pacific Standard Time) on September 26, 1952.

Necessary forms, plans and specifications are available to qualified bidders by depositing $100.00 per set, deposit to be refunded upon return.

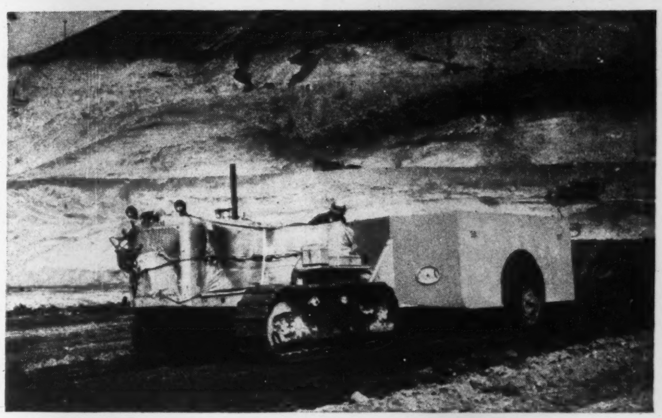
All General Contractors interested in bidding on these two projects are invited to apply by contacting the Housing Authority of the City of Los Angeles, California, at 1401 East 1st Street, Los Angeles 33, California, telephone ANgelus 2-2121.

HOUSING AUTHORITY OF THE CITY OF LOS ANGELES, CALIFORNIA
By: Howard L. Holtzendorff, Secretary

U. S. Government

St. Paul District, Corps of Engineers, US Army, 1217 U.S. Post Office and Custom House, St. Paul 1, Minnesota—Sealed bids will be received at this office until 2:00 P.M., C.S.T., September 9, 1952, and then publicly opened, for Repairs to Watson Sag Dike and to Emergency Spillway and Stone Protection at Dam, Lac qui Parle Flood Control Project, Minnesota River, Minnesota.

(Continued on following pages)



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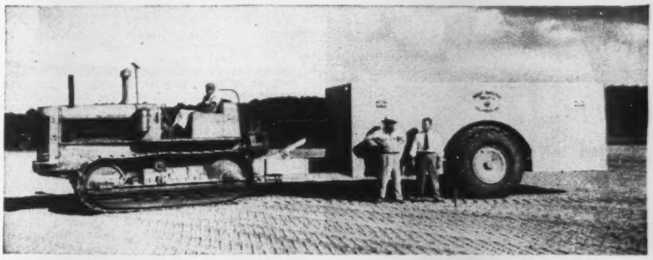
Have you seen a giant rubber-tired Roll-O-Pactor in action? If not, you should see how its extra large wheels and tires put "super load compaction" on deep, soft lifts up to 24 inches . . . how Bros Rocking Beams keep tires squarely in contact with uneven ground, riding slopes as high as 19°. Tested over a variety of actual job conditions, the Roll-O-Pactor has been more widely approved than any other compactor! And it is solidly backed by the complete Bros service organization. 35 and 50 ton models. You can vary rolling weight to suit jobs.



The Wright Construction Company of Columbus, Georgia used a Model 450 Bros Roll-O-Pactor with 70 lb. tire pressure and 40 ton roller weight to compact a 118 lb. per cubic foot sub-grade to 98-100.2% of required density in one pass. After placement of 8 inch base material, they got 100% required density on the base and 98 to 100% as deep as 24 inches in the sub-grade in *three passes.*

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ROLL-O-PACTOR

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Get your free copy of this big new catalog filled with results of soil tests, equipment comparisons and actual job histories. No construction man who is concerned with compaction should be without it! Write for your copy today.

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AS ACCURATE
AND VERSATILE
AS A HANDSAW
10 to 20
Times
as FAST....
Universal teeth; makes all cuts in all woods
Reciprocating long-life twin blades
Cuts at any angle; reaches hard-to-get-at places
No kick, grab or bucking
Weighs under 15 lbs.—easy to handle. Operates on 60 ft. compressor.

Heavy-duty light-weight
WRIGHT PRECISION POWER SAW
slices through a stack of timber *in seconds!*
Cuts on-the-line with only 3/16" kerf.
Chrome-plated blades resharpen and set
like hand saw. Safety-endorsed. Guaranteed.
Write for on-your-job demonstration—
see why no other type of power saw can
equal WRIGHT'S cost-cutting ability.

WRIGHT POWER SAW AND TOOL CORP.

292 Longbrook Ave., Stratford, Conn.

Service and Sales Offices throughout United States, Canada, Hawaii and Europe.

OFFICIAL PROPOSALS

Bids: September 18, 1952

New York State Road Work

STATE DEPARTMENT OF PUBLIC WORKS, Albany, N. Y.—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time on Thursday, September 18, 1952 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 2				
		LACY KETCHUM, Dist. Engr., 109 No. Genesee St., Utica, New York				
Montgomery	RC 52-96	Auriesville-Glen, S. H. 1959	2.39	Asp. Conc. Ty. 1A, Opt.	$3,200 Plans $10	$59,000.00
		DISTRICT No. 5				
		C. R. WATERS, Dist. Engr., 65 Court St., Buffalo, New York				
Ere	GISP 52-2	Grand Island State Parkway, (South Parkway) GISP 51-1	2.44	Landscaping	$1,400 Plans $10	$25,500.00
		DISTRICT No. 6				
		H. F. BRUMM, Dist. Engr., State Office Building, Hornell, New York				
Steuben	RC 52-94	Canisteo-Whitesville Pts. 6 & 7 State Highway 8265-8265A	4.66	Bit. Mac. Rd. Mix	$4,500 Plans $10	$81,000.00
		DISTRICT No. 7				
		C. C. CASSELL, Dist. Engr., 444 Van Duzee St., Watertown, New York				
Lewis	FARC 52-77	Copenhagen-Lowville, Pts. 1 & 2 State Highway No. 1020-847 Proj. F-864(3), F-1043(2)	8.38	Asp. Conc. Ty. 1A, Opt.	$22,000 Plans $10	$405,000.00
Jefferson	DA 52-4	Dry Hll Access Rd. (Town Rd.) Project No AD-4	1.15	Fdtn. Crse. ROB Grav.	$500 Plans $10	$9,022.50
		DISTRICT No. 8				
		J. S. BIXBY, Dist. Engr., Pleasant Valley Road, Poughkeepsie, New York				
Ulster	CT 52-6 ST 52-21	New York State Thruway-Catskill Section-Sub. 3 (Whiteport-Kingston Pt. 2); A Town Rd.; Co. Rd. 42 and Service Drive	2.58 Thy. 1.97 Acc.	9" Cem. Conc. 2 @ 25' Wide = 2.48 Mi. Asp. Conc. Ty. 1A, Opt. = 0.49 Mi. DST Graded Gravel = 0.31 Mi. F. C. Gravel = 1.23 Mi. Misc. Work = 0.04 Mi. Hy. Sep. Alpha I-Beam 269.5'	$111,000 Plans $50	$2,017,000.00
		DISTRICT No. 9				
		F. W. DONOVAN, Dist. Engr, 71 Frederick St., Binghamton, New York				
Sullivan	RC 52-97	Monticello Village, S. H. 5490 Monticello-Woodbourne, Pt. 1, S. H. 8153	5.06	Asp. Conc. Ty. 1A, Opt.	$7,500 Plans $10	$138,000.00
		DISTRICT No. 10				
		J. J. DARCY, Dist. Engr., Little E. Neck Rd. & Montauk Hy., Babylon, Long Island, New York				
Kings	FABQE 52-1	Brooklyn-Queens Expressway (Cont. 16) (Proj. U-1066(9)	0.80	Demolition of Bldgs.	$30,000 Plans $10	$510,000.00
Suffolk	FARC 52-92	Smithtown-Fort Salonga, Pt. 1 S. H. 1048-A Proj. F-566(5)	1.96	Asp. Conc. Ty. 1A, Opt. = 1.95 Mi. Misc. Work = 0.01 Mi.	$14,000 Plans $10	$254,000.00

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3783) will be received at Rapid City, South Dakota, until September 23, 1952, for furnishing labor and materials for Pactola Dam, Missouri River Basin Project. Location: About 30 miles from Rapid City, South Dakota. Principal items are: 960,000 cu. yds. of excavation; 2,400 cu. yds. of tunnel excavation; 3,900,000 cu. yds. of excavation in borrow and rock sources and transportation to embankments; 5,300 cu. yds. of concrete; and other work. Completion time 950 days. For particulars, address Bureau of Reclamation, Huron, South Dakota; or Building 53, Denver Federal Center, Denver, Colorado.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3781) will be received by Bureau of Reclamation, Huron, South Dakota, until September 18, 1952, and then publicly opened for furnishing labor and materials and performing all work for the construction of a 55 mile, wood-pole, H-frame type, 115-kv, 3-phase, single-circuit transmission line, for the Missouri River Basin Project, South Dakota. The work is situated approximately, between Pierre and Midland, South Dakota. Time allowed for completion will be 300 days. For particulars, address Bureau of Reclamation, Huron, South Dakota; or Building 53, Denver Federal Center, Denver, Colorado.

Additional
Proposals
From
Page 366
Thru 374

OFFICIAL PROPOSALS

Bids: September 16, 1952

Route 4, Sec. 4-E, & Route 17, Sec. 7B & 8D, Route 10, Sec. 8

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Route 4, Sec. 4E, from Hackensack River to Route 17, Closing Island Openings, and Route 17, Sections 7B & 8D, Intersection Revisions at Midland, Linwood and Hollywood Avenues, in municipalities of River Edge, Hackensack, Paramus, Ridgewood and Hohokus, Bergen County, Length 2.702 miles,

and

Route 10, Section 8, Revision of Pleasant Valley Way Intersection, Town of West Orange, Essex County. Length 0.116 miles. The principal items of construction are:

Estimated:

Roadway Items

2,260 cu. yds. Roadway Excavation—Earth
799 sq. yds. Pavement Excavation
638 cu. yds. Borrow Excavation
2,200 sq. yds. 10" Plain Concrete Pavement
1,719 sq. yds. Waterbound Macadam Base
1,719 sq. yds. Waterbound Mac. Inter. Course
220 tons Bituminous Conc. Surface Courses
9,253 lin. ft. White Concrete Curb

Electrical Items

3 Underground Structures for Traffic Signal System

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, September 16, 1952 at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3784) will be received at Lindsay, California, until September 24, 1952, for furnishing labor and materials for earthwork, pipe lines, and structures, farm delivery extensions and additional sublaterals for Ivanhoe Irrigation District, Friant-Kern Canal Distribution System, Central Valley Project. Location in the vicinity of Ivanhoe, California. Principal items are: 10,300 cu. yds. excavation; 30 cu. yds. concrete; 24,000 lin. ft. concrete pipe, major portion 12 and 15-inch diameter; and other work. Completion time 120 days. For particulars, address Bureau of Reclamation, Lindsay, California; or Building 53, Denver Federal Center, Denver, Colorado.

(Continued on the following page)

JENNITE J-16®
Surface Seal

B-47 LANDING ON 12,000 FT. RUNWAY OF GRAND CENTRAL AVIATION CO.—TUCSON, ARIZONA. ENGINEERS—BLANTON & COLE OF TUCSON; GENERAL CONTRACTOR—DEL WEBB—SAN XAVIER OF TUSCON; PAVEMENT SEALING CONTRACTOR—SURFACE PROTECTION CO. OF TUCSON.

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Such Pavements Sealed With J-16 Provide Greater Service Life Because:

- J-16 keeps them flexible by stopping oxidizing and volatilizing action of the sun.
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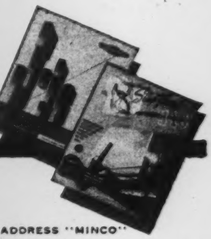
- J-16 eliminates water seepage and resultant frost action.
- J-16, applied without topping aggregate, reduces "pavement-flak" hazard.
- J-16 provides a durable easy-to-clean wearing surface.

Protective maintenance pays profits

For complete details on Jennite J-16—Write for Specifications and these two brochures.



MAINTENANCE INC.
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increase the efficiency...
reduce operating costs...

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4 PROBLEMS

you can solve with

BECKMAN pH Control

Make vitally important savings in the cost of operating and maintaining your power plant by Beckman-controlling the pH of your feed water and steam processes. You can protect costly plant equipment against damaging calcium deposits . . . can reduce requirements of costly chemicals and treating materials.

There is a size and type of Beckman pH meter—from strictly portable to installed, completely-automatic pH control—for every power plant requirement.

① REDUCE COSTLY CORROSION

(especially in steam condensate equipment). Rate of corrosion is a function of the pH of the water. Maintaining high pH minimizes corrosion through formation of protective oxide coatings. pH must be sufficiently high to minimize corrosion, yet low enough to prevent calcium precipitation (see below). **Peak efficiency can be obtained only through accurate pH control!**

② PREVENT CALCIUM DEPOSITS

For each type of softening operation there is a definite pH at which optimum precipitation of calcium is obtained. By controlling the pH, minimum residual hardness is assured. Then, what little hardness remains, is prevented from precipitating in condensers, exchangers, valves, etc., by **lowering** the pH in this part of the system. **Again—peak efficiency can be obtained only through accurate pH control!**

③ OBTAIN MAXIMUM EFFICIENCY

in removing impurities through coagulation. Formation of the floc is greatly influenced by the pH of the solution and type of coagulant used. If alum is used, maximum floc is obtained at a moderately acid pH value . . . if sulphates predominate a **lower** pH value gives best floc . . . while if chlorides predominate, a **higher** pH value (slightly alkaline) must be maintained. **Optimum sedimentation can be obtained only through accurate pH control!**

④ PROTECT VALUABLE ZEOLITE

Zeolites are rapidly disintegrated by water with **low** pH and are also softened and disintegrated by water of **high** pH. By Beckman-controlling pH before water enters Zeolite, costly chemical losses are eliminated and vital plant economies are effected. **Here again, topmost efficiency can be obtained only through accurate pH control!**

Illustrated at right is the Beckman Model R pH Indicator—the ideal equipment for power plant installations.

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OFFICIAL PROPOSALS

Bids: September 16, 1952

Route 25, Cooper River Bridge

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commission for:

Route 25, Cooper River Bridge, Reconstruction of Deck on Bascule Span & Roadway Approaches, City of Camden, Camden County. The principal items are:

Bridge Items

Estimated:

85	cu. yds. Class "B" Concrete
3,550	lbs. Reinforcement Steel
106,800	lbs. Structural Steel
9,680	sq. ft. Steel Grid Flooring
13.6	M.B.M. Timber Structures
85	tons Pavement, Type MA-BC-2

Roadway Items

248	sq. yds. Reinforced Concrete Pavement
1,742	lin. ft. White Concrete Vertical Curb
	Lump Sum—Maintenance of Traffic

Bids for the above will be received at the offiee of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, September 16, 1952 at ten o'clock (10:00 A.M. — EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: September 16, 1952

Rt. 35, Secs. 2A, 41 & 42, & Rt. 37, Sec. 2A

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Route 35, Sections 2A, 41 and 42, and Route 35, Section 2A, Drainage Improvement and Underground Structures for Traffic Signals, Boroughs of Eatontown, Point Pleasant Beach, Point Pleasant, Seaside Heights and Township of Dover, Monmouth and Ocean Counties. Length 0.862 miles. The principal items of construction are:

Estimated:

528	cu.yds.Roadway Excavation—Earth
2,306	sq. yds. Penetration Gravel Shoulders
1,536	sq. yds. Gravel Base Course
1,156	sq. yds. Conc. Pavement, Rein. 9" thick
5,543	lin. ft. Rein. Conc. Pipe
116	lin. ft. Cast Iron Pipe
4	Underground Traffic Signal Systems

(Continued on following pages)

OFFICIAL PROPOSALS
(Continued from preceding page)

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, September 16, 1952, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

BIDS—OCTOBER 1, 1952. PHILADELPHIA, PENNA. PROCUREMENT DEPARTMENT — WATER DEPARTMENT. Sealed Proposals will be received at Room 305 City Hall Annex, until 1:30 P.M., Eastern Standard Time, Wednesday, October 1, 1952, and opened at that time in Room 313 City Hall Annex, Philadelphia, Pennsylvania, for CENTRAL SCHUYLKILL WEST INTERCEPTING SYSTEM SEWER IN PRIVATE PROPERTY AND IN SCHUYLKILL AVENUE WEST FROM A POINT ABOUT 408 FEET EAST OF 34TH STREET TO A POINT 527.5 FEET NORTH OF MARKET STREET WITH INTERCEPTING CHAMBERS AND APPURTENANT WORK. CONTRACT NO. SD 109 SW. Principal items of work—2,394 feet of 4′ 0″ diameter concrete sewer in earth tunnel. 3,830 feet of 48″ and 42″ diameter reinforced concrete culvert pipe on timber piles. 3 intercepting chambers with automatic sewage regulators. Proposal forms and specifications may be obtained in Room 1101 City Hall Annex. Blueprints of plans may be purchased at bidder's expense, directly from the Keystone Blue Paper Company, 51 North 13th Street, Philadelphia 7, Pennsylvania. No bids will be received unless bidder is qualified by the Procurement Commissioner. The questionnaire form with all questions fully answered must be filed with the Water Commissioner, 1103 City Hall Annex, Philadelphia 7, Pennsylvania, at least one (1) week prior to the date of opening bids. Each bid must be accompanied by security in form and amount as set forth in the proposal form.

CHARLES H. FRAZIER,
Procurement Commissioner.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3782) will be received at Tucumcari, New Mexico, until September 25, 1952, for furnishing labor and materials for earthwork and structures, Drains 3 and 6, Tucumcari Project. Location: About 8 miles from Tucumcari. Principal items are: 79,000 cu. yds. of excavation for drains and structures; laying 1,400 lin. ft. of 24 to 36-inch diameter concrete pipe; 75 cu. yds. of concrete; and other work. Completion time 120 days. For particulars, address Bureau of Reclamation, Tucumcari, New Mexico; or Building 53, Denver Federal Center, Denver, Colorado.

(Continued on the following page)

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International Steel has an impressive record of service for its customers.
Delivery on schedule . . .
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Steel structural framing for the
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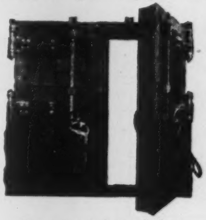
Framing to unusual specifications for
Indianapolis Speedway grandstand


Heavy reinforced doors
for jet engine testing

INTERNATIONAL
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STRUCTURAL STEEL
INDUSTRIAL DOORS
REVOLVING DOORS
STEEL BUILDINGS

1907 EDGAR STREET
EVANSVILLE 7, INDIANA

STOP FIRES FAST with INDIAN FIRE PUMPS

Protect property, guard lives with these famous back-pack extinguishers. Contractors and construction engineers find them very necessary in their outdoor work. The Flame Guns and the Drinking Water Tanks are a "must with them."

FLAME GUN SPRAYER

HUNDREDS OF USES

2000 degrees controlled heat. Destroys weeds, brush, rubbish. For burning safety strips and fire lanes. 4 gal. tank. 7 ft. oil proof hose. Light. Compact. Portable. Burns kerosene or range oil.

Smith INDIAN Drinking Water & Supply Tank

For carrying drinking water to fire fighting crews, and refilling Indian Fire Pumps. 5-gal. cap. Push button faucet. Carries by handle or slung on back.

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Send for Full Details on INDIAN FIRE PUMPS and our Complete Line of Sprayers

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"Originators of Sprayers Since 1888"
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- Drilled Piling
- Caissons
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- Large diameter Wells

CAISSON SHAFT SIZES 16" to 84"

BELL SIZES 2' TO 12'

CASEY & CASE
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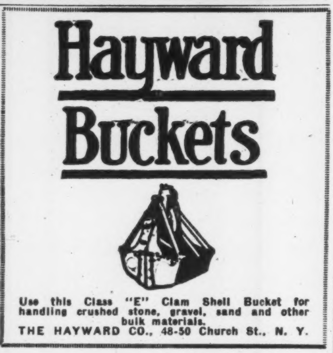
Phone:

DETROIT ....BRoadway 3-3411
CHICAGO ....CEntral 6-6579
LOS ANGELES ....DUnkirk 8-9335
SAN FRANCISCO. LAndscape 6-8622

Write for Bulletin


Hayward Buckets

Use this Class "E" Clam Shell Bucket for handling crushed stone, gravel, sand and other bulk materials.

THE HAYWARD CO., 48-50 Church St., N. Y.

HOT DIP GALVANIZING

YOU can profit by our experience of over 50 years in Hot Dip Galvanizing. Our equipment is modern, our men are skilled and our deliveries and prices are right.

We have galvanized thousands of tons of: gratings, beams, bars, perforated screens, sections, forms, tanks, fittings, rails, fastenings, etc. *Excellent facilities for pickling and oiling.*

ENTERPRISE GALVANIZING CO.
2517 E. CUMBERLAND ST. • PHILADELPHIA 25, PA.

OFFICIAL PROPOSALS

Bids: September 16, 1952

Route 1 (1917), Section 15-B, Route 25, Sec. 5-F

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Route 1 (1917), Section 15-B, from New Brunswick City Line to Mill Lane, Pavement Widening, North Brunswick Township, Middlesex County. Length 0.967 miles,

and

Route 25, Section 5-F, Intersection Revisions and Closing Island Openings at Wooding Avenue, Raritan Township, Middlesex County. Length 0.347 miles. The principal items of construction are

Estimated:

4,150	cu. yds. Roadway Excavation
340	lin. ft. Reinforced Concrete Pipe
2,240	sq. yds. Waterbound Macadam Base
2,240	sq. yds. Penetration Macadam Inter. Course
265	tons Bituminous Concrete Surface
6,813	sq. yds. Concrete Pavement Surface
7,877	lin. ft. Concrete Curbs
1	Underground Traffic Signal System

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, September 16, 1952, at ten o'clock (10:00 A.M. — EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-3778) will be received at Denver, Colorado, until September 30, 1952, for furnishing one 150-ton single-trolley, motor-operated traveling crane for Palisades Project, Idaho. Delivery is desired within 480 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

OFFICIAL PROPOSALS

Bids: September 23, 1952

Shavertown Bridge Piers and Abutments

CONTRACT 415

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York

(Continued on the following page)

OFFICIAL PROPOSALS

City, until 10:00 A.M., Eastern Standard Time, on Tuesday, September 23, 1952, for Contract 415, for the construction of the piers and abutments of the Shavertown bridge, in the Town of Andes, Delaware county, New York. The bridge will cross the valley of the East Branch of the Delaware river at a point about one mile east of the village of Shavertown. The piers and abutments will be constructed of reinforced concrete and partly faced with granite, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York, in the amount of fifty thousand dollars ($50,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained at the office of the Chief Engineer, Room 1311, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, RUFUS E. McGAHEN, EDWARD C. MAGUIRE, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

U. S. Government

GOVERNMENT OF THE DISTRICT OF COLUMBIA, DIRECTOR OF SANITARY ENGINEERING, D. C., August 8, 1952. SEALED PROPOSALS will be received in Room 429, District Building, 14th and E Streets, N. W., Washington 4, D. C., until 2:00 P. M., September 25, 1952, EASTERN DAYLIGHT TIME, and then publicly opened and read for Sludge Disposal Plant, Structures and Equipment (Unit 17), and Chimney (Unit 18), Sewage Treatment Plant, Washington, D. C. This project will house equipment, able to dry or incinerate sewage sludge removed by a high rate activated sludge treatment plant to serve 1,500,000 persons. Proposal Forms, Drawings and specifications may be obtained from the Chief Clerk, Engineer Department (Secretary, Contract Board, D. C.), Room 427, District Building, upon the deposit of a certified check made payable to the Collector of Taxes, D. C., in the amount of FIFTY DOLLARS ($50.00) for each set. (Telephone National 6000, Ext. 2378)

OFFICIAL PROPOSALS

Bids: September 11, 1952

Soil Explorations—SM-39A

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed pro-

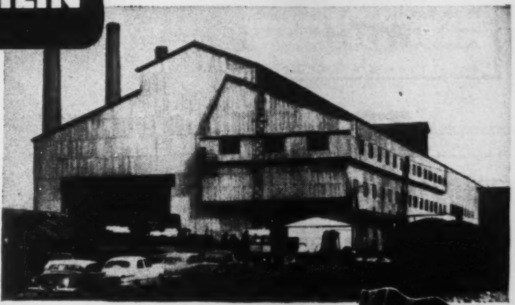
(Continued on page 374)

PHOENIX BRIDGE COMPANY

Engineers—Fabricators
Erectors
Structural Steel
BRIDGES and BUILDINGS
General Office
and Shops
PHOENIXVILLE, PA.
Subsidiary—Barium Steel Corporation

JONES and LAUGHLIN

PLASTEEL—Chosen for part of New Otis Works buildings which house J&L'S new open hearth furnaces and will help increase production in Cleveland by 200,000 net tons annually.



CHOOSES

Plasteel

PROTECTED STEEL
ROOFING and SIDING

STEEL
RUST INHIBITOR
ASPHALT PLASTICS
MICA
MICA makes the DIFFERENCE

GOES UP FAST—
LASTS AND LASTS!

PLASTEEL speeds erection! It's light in weight, easy to handle, requires no skill. Best of all, PLASTEEL prolongs the life of your buildings. *Mica makes the difference!* It prevents deterioration! Adds protection! Insulates! Beautifies!

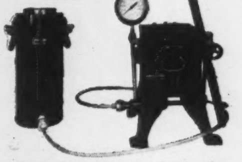
Plasteel is tested and classified by Associated Factory Mutuals Laboratories and Underwriters Laboratories.

PLASTEEL
PRODUCTS CORP.
WASHINGTON, PENNSYLVANIA

Plasteel Products Corporation — EN 9-52
Washington, Pennsylvania
Please send Plasteel Sample ☐ Data Sheet ☐
Name.................... Title..........
Company....................
Street.......... City.......... State..........

DUDGEON SALES AND RENTALS

Manufacturers Since 1850 of HYDRAULIC JACKS
CAPACITIES TO 600 TONS



Heavy Duty Types for Construction, Bridge, Marine, Load Testing, Pipe Forcing, Tension.

For short jobs that require high-priced equipment, reduce costs through rentals:

NO STORAGE
NO MAINTENANCE
FACTORY-TESTED, CORRECT EQUIPMENT FOR EACH JOB

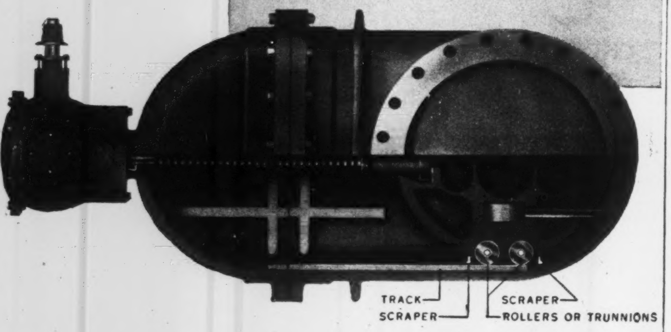
Standard and Special Types

RICHARD DUDGEON, Inc.
787 BERGEN ST. BROOKLYN 16, N. Y.

MH

VALVES WITH ROLLERS

TRACKS & SCRAPERS



Easy operating

To avoid undue wear of moving parts when installed in horizontal position, large size M & H double disc gate valves may be ordered equipped with rollers or, rollers, tracks and scrapers. This is recommended when large valves are installed on their side and the heavy weight of the gate assembly creates a drag on the underside where it rests on the body. Rollers, tracks and scrapers make the heavy gate assembly easy to open and close, reduces wear and possible damage to the disc rings or the seat rings. For complete information, write or wire M & H Valve and Fittings Company, Anniston, Alabama.

M&H PRODUCTS FOR WATER WORKS • FILTER PLANTS INDUSTRY • SEWAGE DISPOSAL AND FIRE PROTECTION

25 YEARS EXPERIENCE

for SATISFACTION

Foundation

WELLPOINT SYSTEMS

RENTAL • SALES

SEND FOR LITERATURE

Foundation Equipment
CORPORATION

Long Island City 1, N. Y.
38th Ave. & 10th St.
EXeter 2-1100

Chicago Illinois
2608 W. 111th St.
Hilltop 5-8282

OFFICIAL PROPOSALS

posals will be received until 10:30 a.m., Eastern Daylight Saving Time, on September 11, 1952 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE NEW YORK STATE THRUWAY, HUDSON SECTION, SUBDIVISION 7, SUFFERN TO HARRIMAN, CITY OF SUFFERN AND TOWNSHIP OF RAMAPO, ROCKLAND COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-39A.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.
(c) Charles Schaefer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $34,525.00.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1727.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

B. D. Tallamy
Superintendent of Public Works

Bids: September 11, 1952

Soil Explorations SM-40A

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m., Eastern Daylight Saving time, on September 11, 1952 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE NEW ENGLAND THRUWAY, POST ROAD TO LARCHMONT, TOWNS OF NEW ROCHELLE AND LARCHMONT, CITY OF NEW ROCHELLE, WESTCHESTER COUNTY, WHICH CONSTITUTES CONTRACT NO. SPC. SM-40A

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.
(c) Charles Schaefer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost of this work is $19,910.00.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

B. D. Tallamy
Superintendent of Public Works

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

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$1.50 cents a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

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PROPOSALS, $1.50 a line an insertion.

INFORMATION.

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The advertising rate is $17.10 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

NEW ADVERTISEMENTS Address New York Office, 330 W. 42nd St., N. Y. 36, for September 18th issue closing September 8th

ENGINEERS WANTED

Private Consulting Firm Engaged in General Civil Engineering Practice Desires Experienced Highway, Bridge and Reinforced Concrete Designers. Write, Giving Resume of Experience and Personal History to

P5147 Engineering News Record
520 N. Michigan Ave. Chicago 11, Ill.

STRUCTURAL and BRIDGE DESIGNERS
RESIDENT ENGINEERS
RECENT GRADUATES

SEELYE STEVENSON VALUE & KNECHT
101 Park Avenue, New York 17, N. Y.
Telephone: MU 4-2500

WANTED
Experienced Excavation and Grade
FOREMEN

A. S. WIKSTROM, INC.
Skaneateles, N. Y. Tel: Skaneateles 661

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

ARCHITECTURAL SPECIFICATION writer, assistant, with knowledge of construction trades and building materials, for large Detroit office. Experienced man preferred, but will train architectural or civil graduate with proven writing aptitude. Long term employment with nationally known architects and engineers. Salary $5000-$6500 to start depending upon experience and education. Send resume of above, with data available. **P-4976**, Engineering News-Record.

BRIDGE DESIGNERS—Checkers—Detailers—Experienced men for work on heavy truss and arch bridges and expressway structures. Health and insurance benefits, vacation and paid holidays—Top salaries. Permanent employment for those who qualify. **P-5160**, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT wanted to act as General Superintendent by one of the largest contractors in Western New York. Must be experienced in construction foundation work, commercial and general construction. Submit resume stating education, experience, age, availability and salary expected. **P-5146**, Engineering News-Record.

CONTRACTOR'S ENGINEER—Experienced in estimating quantities for all types of general building construction for general contractor located in central Pennsylvania. Civil or architectural engineering degree preferred, but not necessary. In reply, state experience, references, and salary desired. **P-5135**, Engineering News-Record.

DESIGNERS FOR bridges, structures, and sanitary work in Rhode Island. Send experience record to P.O. Box 752, Providence, Rhode Island.

ESTIMATOR FOR built-up roofing, sheet metal, heating, and duct work. State qualifications, salary, and experience. Guy M. Wilson, Roofing Contractor, Lexington Park, Md.

HEAVY CONSTRUCTION
Asst. Superintendent or Genl. Foreman

WANTED

Experienced in earth and rock excavation, heavy concrete work (no buildings), sewers, pile driving, etc., as encountered in construction of powerhouses, dams, flood walls, pumping stations, large sewers, etc., by large contractor operating throughout the Middle West and East. Permanent position with excellent salary for man with above qualifications. Please state age, experience, present salary, firms worked for recently and duration of employment and when available.

P-5142, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ENGINEERS

Structural, mechanical, and electrical for work on hydro-electric power developments. Write giving full experience record and qualifications.

HARZA ENGINEERING COMPANY
400 West Madison Street Chicago, Illinois

POSITIONS VACANT

GENERAL MANAGER for medium sized structural steel fabricating plant in Mid West. Includes supervision of sales in surrounding area. Overall charge of branch office and plant of large progressive company. Experience in structural steel business required. Furnish full information regarding qualifications, experience and salary requirements. **P-5161**, Engineering News-Record.

QUANTITY SURVEYOR experienced in general building construction for general contractor's office located in central Pennsylvania. College graduate in Architectural or Civil Engineering preferred but not necessary. In reply, give experience, references, and salary desired. **P-5006**. Engineering News-Record.

SEVERAL ENGINEERS in office of consultant on sanitary projjects, experienced in this or related fields such as structural or hydraulic. Permanent positions intended. Full information, references and salary requirement requested. Location, Ohio. **P-5092**, Engineering News-Record.

STRUCTURAL STEEL Detail Draftsmen and Checkers. All types of Structures. Vacation and bonus plan, group insurance, good working conditions. Only top quality men. Send complete written information, Sanborn, Steketee and Associates, 1214 Cherry Street, Toledo 2, Ohio.

WANTED CIVIL Engineer; graduate, with experience in sanitary and storm water design and construction, to act as survey party chief, and chief draftsman and assist Town Engineer in small municipal Engineering Department. Salary $5200. to $5600. to start. **P-5207**, Engineering News-Record.

WANTED. EXECUTIVE for general contractor. Must have complete knowledge of estimating, buying and expediting; the experience and ability to assume responsibility. Must be exceptional man and will receive in return proper salary. Cunningham Brothers, Inc. Since 1874, Beloit, Wisconsin.

WANTED: FOREMAN for sewer and water work. Send qualifications, experience and salary expected to: PO Box 329, Hyattsville, Md.

(Continued on the following page)

ENGINEERS & DRAFTSMEN

MECHANICAL

Experienced Plumbing, Heating, Ventilation

HIGHWAY

Experienced all aspects.

STRUCTURAL

Experienced Bridge & Viaduct Designers & Detailers.

Expanding Company has permanent positions available in the Pittsburgh, Pa. area or in Baltimore, Md. Submit your complete background in your initial letter. Your confidence will be strictly observed.

GREEN ENGINEERING COMPANY
SEWICKLEY, PA.

ENGINEERING TECHNICIANS

Experienced in Batch plant and Site control of Concrete Plant control and Site inspection of Asphalt paving; Compaction control of Earth fill, Soil boring and Core drill inspectors.

Engineering Geologists, Concrete Technologists, Asphalt Paving Technologists and Construction Engineer, Graduate engineers P.E. registration preferred, also materials laboratory technicians and chemists. Project in Midwest, South and East.

TOLEDO TESTING LABORATORY
TOLEDO, OHIO

SUPERINTENDENT WANTED

Experienced in Concrete, Pile Driving, Earth Cofferdams, and General Heavy Construction Work. Must Know Operation and Maintenance of Heavy Construction Equipment. Need not be graduate engineer but must have experience and qualifications mentioned. Work is in Gulf Area and the position is Open Now. Write details—age, experience, availability, etc., to

P-5148, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

(Continued from preceding page)

EMPLOYMENT SERVICE

SALARIED PERSONNEL, $3,000-$25,000. This confidential service, established 1920, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven. Conn.

POSITIONS WANTED

CIVIL ENGINEER, Graduate, Registered. 24 years experience. Heavy Construction Supervision and Engineering Design. Desires permanent, responsible supervisory or Project Engineering position. South or Southwest. Other locations considered. Minimum salary $10,000. PW-5078, Engineering News-Record.

CIVIL ENGINEER: Resident or Contractor's Engineer, immediately available. Construction and layout of airports, highways, drainage, grading, paving. Inspection and field plan adjustments. Diversified engineering experience about 40 years includes responsible supervisory U. S. and foreign assignments. Reg. R.E. N.Y. Willing to travel. Excellent references. PW-5241, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT. Concrete pipe manufacturer, considerable experience machine and cast methods. PW-5217, Engineering News-Record.

COST ENGINEER, on public buildings, will represent you in Dist. of Col. & vicinity; experienced draftsman; has extensive experience on heating, ventilating & electrical. Will not consider straight commission. PW-5155, Engineering News-Record.

ESTIMATOR & Superintendent Electrical Construction, age 31, now employed as staff engineer, experience includes takeoffs, pricing, purchasing, drafting, job scheduling, commercial and industrial work. Desires field work. Domestic or foreign. PW-5200, Engineering News-Record.

GENERAL SUPT.-Project Manager 26 years—light and heavy construction. Housing Dir. Large Concrete structures. Commercial and Industrial work. Excellent record on costs and completion dates. PW-5237, Engineering News-Record.

PROJECT MANAGER—Professional Engineer, 15 yrs design, construction & administration. Hydro & steam electric power stations, heavy industrial. Present concern has been advised. PW-5039, Engineering News-Record.

RESEARCH AND Development Engineer, structural and building products, 12 yrs. successful experience, married, 34, graduate C.E., desires responsible position with future. PW-5062, Engineering News-Record.

SANITARY ENGINEER. Five years professional experience. Industrial (boiler feed) and Municipal Water Treatment. Industrial and Municipal Waste Disposal. PW-5042, Engineering News-Record.

STRUCTURAL ENGINEER and estimator. Former structural head engineering firm. Experience power-chemical and industrial plants. PW-5282, Engineering News-Record.

SUPERINTENDENT CONCRETE. Thoroughly experienced in all phases of concrete. From specifications to manufacture. Laying out of Plants, erection, designing of Mixes. Placing and handling of concrete. Batch and crushing plants foundations, refineries, powerplants, pre-cast runways. PW-5057, Engineering News-Record.

SUPERINTENDENT - PROJECT Manager — Qualified as journeyman in 5 trades before becoming C.E. Reg. Prof. Engr. New York and Michigan. Able to meet any agreed schedule and reduce unit costs. Reviews plans and details of all trades to obtain complete coordination in the field. Select proper tools and equipment to meet schedule. Desires position of responsibility on Hospitals, Bridges, Power Plants, Housing, Industrial and Heavy Construction. Extremely cost conscious. PW-5163, Engineering News-Record.

SUPERINTENDENT. ROADS, Airports, heavy equipment. Twenty years construction experience, fourteen on foreign work, worldwide. Prefer foreign assignment. PW-5244, Engineering News-Record.

SALARIED POSITIONS $3,500—$35,000

We offer the original personal employment service (established 42 years.) Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars.

R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N. Y.

A COURSE OF INSTRUCTION BY MAIL IN

STRUCTURAL ENGINEERING

Forty-second Year

OUR COURSES HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations

- Complete Structural Engineering Course.
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- Special Course C (State Board Exams).
- Reinforced Concrete Engineering.
- Structural Steel Designing.

Monthly payments permissible. Information sent without obligation. WRITE TODAY

WILSON ENGINEERING CORPORATION

College House Offices • Harvard Square • Cambridge, Mass., U. S. A.

BUSINESS OPPORTUNITIES

Licensed Engineer seeks Qualified partner to start construction business. BO-5197, Engineering News-Record.

Opportunity to purchase profitable, well-established surveying business within Metropolitan area of New York City. BO-5194, Engineering News-Record.

SPECIAL SERVICE

Bids: September 19, 1952

Job Evaluation Survey Town of Stratford, Conn.

Sealed Bids will be received at the Office of the Town Manager until 5:00 P.M. September 19, 1952.

The purpose of the survey is to develop a job classification and pay plan, for all Town Employees, except School Teachers.

1. Development of Job descriptions.
2. Evaluation of all Jobs.
3. Survey of area rates for comparable jobs and analysis with relationship to the Town of Stratford salary structure.
4. Organization and analysis of the data secured.
5. Development of a report of findings.

Approximately 275 personnel effected.

State experience and municipalities for whom you have performed similar work and estimated completion date.

The Town of Stratford reserves the right to accept or reject any or all proposals, or to accept any proposal or part thereof deemed to be in the best interest of the Town of Stratford.

HARRY B. FLOOD
Town Manager

FOR SALE

69% interest in structural steel fabricating and miscellaneous iron work company, billing over $300,000 annually.

25,500 sq. ft., plant located in Oakland, Calif., on 86,000 sq. ft., plot fronting on San Francisco Bay. Spur track, installed way for launching barges, etc., 4 travelling cranes, good machines and tools.

Good stock of steel and contract for 6 months work on hand.

BO-5023, Engineering News-Record
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D7 Tractors with Trackson Sidebooms. Also 3T D7 with Caterpiller Hydraulic Angledozer and Hyster Winch. Also D7 and D8 LeTourneau DDPCU $350; D7 Bulldozer or Angledozer Blades, complete $400. Used D7 Tracks.

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USED SELF-PROPELLED MOBILE ¾ YARD SHOVEL

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25 Ton With 50 Ft Crane Boom

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With Standard Base

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D8 - D7 - D6 - D4HT4 - D4 - D2 - TD24 - TD18A - TD14A - TD9 - TD6 - HD20 - HD15 - HD9 - HD5G

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PLUS Complete shop and field service facilities to keep you going
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AIR COMPRESSORS, 75 to 600 ft. capacity
BACK HOES
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BROOMS, Street and Road
BUCKETS—Clam Shell, Concrete, Dragline, Scraper and Orange Peel
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36 YEARS OF "SERVICE"

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Northwest Model 25 Dragline, Serial #10150, Cat Diesel Engine. Available immediately $7,500.00 fob Evansville, Ind. Pull Shovel Front available if desired. Model 44C Barber-Greene Trenching Machine with 8'3" Boom. Purchased new in 1950. Excellent condition. Available August 15th, $6,750.00 fob Evansville, Ind.

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80 FT. TRUSS TYPE
Also Large Girder Beams
ACORN IRON & SUPPLY CO.
915 N. Delaware Ave., Dept. B
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100 TONS

Reconditioned Equipment
FOR SALE
AT REDUCED PRICES . . .

Super C. Tournapulls, Scrapers (tractor drawn), C and D Roadster Tournapulls.

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All Current Model Rebuilt Machines with New Machine Guarantee

Concrete Pump Specialists for 15 Years

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STEEL

75 tons	6" H	20#	40'
100 tons	8" H	31#	40'
75 tons	10" H	49#	40'

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STEEL SEWER-TUNNEL FORMS & TRAVELERS

120 LF. 7' x 7' Adjustable to 7' x 6'.
60 L.F. 7' x 7'.
Panels 5' for assembly in 20' units on traveler
120 L.F. Steel invert forms
12" Radius 8' panels
A. S. WIKSTROM, INC.
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COMPRESSOR

GARDNER-DENVER 210 cu. ft. on 4 steel wheels. Good Condition. Price . . $1,850.00

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DEPENDABLE USED MACHINES

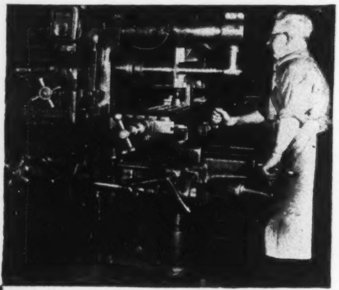
Special,—New Morris 10" manganese steel gravel pump. Substantial price concession. Come see it!

Quickway shovel
Butler Carscoop
Robins belt tripper
Lessman loader
3 yd. Dumpcrete
Hughes-Keenan Roustabout crane
20"x40' port. belt conveyor
10x30 r.b. crusher with engine
Cedar Rapids 15x36 crusher
Pioneer 4x8 screen, rebuilt
Galion motor grader
3x12 revolving screen
Eagle coal crusher
Waukesha 6-MZR engine
Lorain 40 shovel

For rent,—cranes, draglines, backhoes, buckets, and all other accessories.

10002 Southwest Highway **TRACTOR & EQUIPMENT CO.** Oak Lawn, Ill.

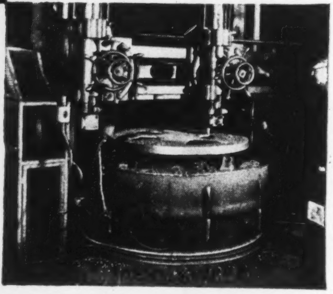
He works with Doctor-like thoroughness



↑ Milling operation on #3 Brown Sharpe milling machine.
Milling slot in Hoist control lever for American locomotive crane now being rebuilt for Bobcock-Wilcox Tube Co., Barberton, Ohio.

← Turret Lathe operation on #5A Gisholt turret lathe.
Turning—boring—facing and cutting to length. Bronze bushings for Lorain 820 turntable rollers. With parts in short supply as they are today, the ability to help ourselves is money in our customers' pockets.

Boring mill operation on 60 in. Niles vertical boring mill.
Turning and facing cylinder end casting for Robot laundry washer.



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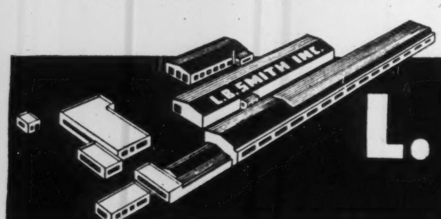

L. B. SMITH INC.

L. B. SMITH INC.

CAMP HILL, SUBURB OF HARRISBURG, PA.

L. B. SMITH INC.

New and Used Equipment News

Prepared Monthly by Ed Woolford at Camp Hill, Pa.

VOL. 1 No. 6

AIR COMPRESSORS

Gardner-Denver 500 cu. ft. diesel, new condition.
Gardner-Denver 500 cu. ft. diesel, good operating condition.
Schramm 105 cubic foot gas powered compressor on 4 steel wheels.
Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven 50 HP slip ring motor.
Worthington two-stage, water-cooled, vertical 250#, 60 CFM, new condition.
Paving breakers, jackhammers, wagon drills, tie tampers.

QUARRY EQUIPMENT & BINS

2036 Cedarapids primary unit.
1036/2418 Cedarapids Jr. Tandem unit.
4024 Cedarapids roll, rebuilt.
3018 Cedarapids roll, rebuilt.
Cedarapids Rock-It plant with 2025 jaw, 3033 mill. New.
Cedarapids 1236 Model 6C plant, new.
4033 Cedarapids Hammermill, rebuilt.
1030 Good Roads. Reconditioned.
10x7 Allis-Chalmers Blake type jaw crusher.
#1 Cedarapids Kubit impact breaker.
4' x 6' Kennedy Van Saun single deck.
3' x 6' Kennedy Van Saun triple deck.
15 cu. yd. Cedarapids sand drag, new.
16" x 90' bucket elevator.
60-ton, 2-compartment, 8'x18' storage bin with clamshell gates.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also belt.

TRUCKS—TRAILERS

1½-ton Ford with any body.

2000-gallon tanks on semi-trailer mounting.

New and rebuilt dump bodies.

GENERATORS & LIGHT PLANTS

1½ KW to 125 KW, alternating and direct current gasoline and diesel powered.

SHOVELS—CRANES

Lorain 820 Dragline. New 1951.
Lorain 77, 1½-yd. shovel, gas or diesel power.
Osgood Model 900, 1¾-yd. diesel combination.
Lorain 57, 1¼-yd. diesel. Excellent.
Lorain L-50, 1-yd. diesel. New condition.
Lorain 40 truck crane on Mack 3-axle truck.
Unit 1020, ½-yd. shovel, good condition.

SHOVEL & CRANE ATTACHMENTS

Lorain L-41 Chain Crowd Shovel Attachment. Rebuilt.
Lorain 40 Hi-Lift shovel attachment.
P&H 203 shovel attachment.
Chain crowd Lorain 30A shovel attachment.
Bucyrus-Erie 1½-yd. rock bucket.
McCaffrey Model 648 for 1¼ to 2-yd. crane.
McCaffrey Model 636 for ¾-yd. to 1-yd. crane.

Backhoe Buckets & Attachments

Lorain 30 hoe attachment complete.
¾-yd. Lorain, 40, LBS #6105. 44" cutting width.
¾-yd. Amsco 40" cutting width, LBS #8101.

CLAM—DRAG—SCRAPER BUCKETS

LIFTING MAGNETS

2—45" Ohio lifting magnets, rebuilt.
1—36" ECM lifting magnet, rebuilt.

SHOVEL DIPPERS

Lorain 41, ¾-yd. LBS #8600, rebuilt.
New Lima 1-yd. Amsco, LBS #2295.
Bucyrus-Erie 1¼-yd. gas air, LBS #3782, fair.
Lorain 75B, 1½-yd. manganese bucket, LBS #8538.
Lorain 75B, 1¼-yd. extended lip, 1¾-yd. LBS #2260.
Pettibone-Mulliken 2-yd. Lorain 82 or 820, manganese, LBS #5361.
Pettibone-Mulliken 2-yd. for 3500 Manitowoc LBS #5763.
Esco 2½-yd. cast weld dipper with bail & teeth.

CONCRETE EQUIPMENT

Blaw-Knox gas-electric finisher, 10½'-12½', rebuilt.
Koehring 10'-12' finishers, rebuilt.
1220'—Heltzel 9"x8" road forms with stakes.
Cleveland formgrader, new 1944, rebuilt.
Corr formgrader, new 1944, rebuilt.

TRACTORS

TD-24 International with Bucyrus-Erie angleblade.
TD9 International diesel with 1 yd. Loadover.
Model CR Tournapull w/16-yd. Model E16 Tournarocker, rebuilt.

WELL DRILLS & TOOLS

Sanderson-Cyclone #42 well drill, new.
Sanderson-Cyclone #44 well drill, new.
Bits—Stems—Bailers—Sockets—Etc.

Barber-Greene 44C Trenching Machine 18" to 24" cutting width, 7' depth.

PUMPS

New Layne Bowler type 18 deep well pump with right angle gear drive, 3000 GPM at 120' TDH.
Used and rebuilt pumps, all sizes, gasoline, electric or diesel.

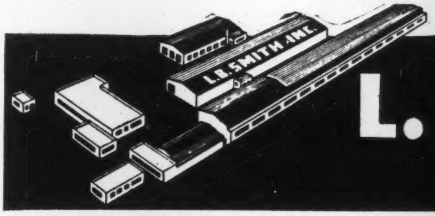
GRADERS

Austin Western 77 tandem drive, scarifier, 12' blade, gas power, hydraulic controls.

GASOLINE AND DIESEL ENGINES

Caterpillar D11000, rebuilt.
Caterpillar D13000, rebuilt
Buda, Hercules, Hill diesels, rebuilt.
New and rebuilt Murphy diesels, ME-4 & 46.

***Phone* HARRISBURG, PA. 7-3431**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CAMP HILL, SUBURB OF HARRISBURG, PA.

ELECTRIC MINE LOCOMOTIVES

Thoroughly Reconditioned

16—GREENSBERG "CRUISER" storage battery locomotives, two motor drive, 24" gauge, with the following specifications:

Track Gauge (Convertible to 36")	24 Inches
Length Overall	144 "
Height Overall (With High Type Battery)	49 "
Chassis Width (Wheels inside frame)	42 "
Width, Battery Box Overall	42 "
Chassis Weight	7,250 Pounds
Total Weight, Including Battery	6 Tons
Wheel Base	38 Inches
Radius of Minimum Curve	12 Feet
Diameter of Axles	4 Inches
Diameter of Wheels	19 "

Two Elec. Motors, Westinghouse, Heavy Duty, Series Type Motors, 14 H.P. Each

Series Parallel Controller

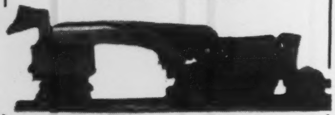
Transmissions—Double Reduction Gear Type

Speed Light—7 M.P.H. Loaded—4 M.P.H
Built 1947-1948

31—Exide TLM 48 Cell, 19 Plate Battery, Equivalent to 41.712 KW. Under Full Charge

12—Battery Chargers From 10 KW To 30 KW For Above With Automatic Control Panels

MUCKERS



4—Muckers, Eimco Rocker Shovel. Model 40 equipped with Ingersoll-Rand EE5 UP & KK5D Air Motors for 36" ga. track and pony att. for tramming on 24" track; equip. with horiz. & vert. swing adjust on conveyor. Serial Nos.: 40057, 40058, 40063, and 40066.

2—Muckers, Eimo Rocker Shovel, Model 21 for 24 gauge track, equip. with Ingersoll-Rand Air Motors, model HH5D, Serial Nos. 3483 & 3904.

Liquidating Assets of Former
Samuel Rossoff Ltd.

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Randallstown, Md. P. O. Box 440
Phone Oldfield 5377
Lincoln Liberty Building
Philadelphia, Pa.
Phone Rittenhouse 6-7455

SHOVELS

ITEM

1 1—Lorain Model L-820J Shovel, powered by Waukesha WAKD Diesel Engine, 34" tread, with standard shovel front consisting of 23' boom, 18" stick, 2 cu. yd. dipper

2 1—Lorain Model TL-25 Shovel, powered by Caterpillar D-315 Diesel Engine, with 16'6" boom, 14'6" stick, ¾ cu. yd. dipper

SCRAPERS

13 2—Isaacson Model KS-2000 Karry Skraper with (4) 24:00x32 tires, 20 yd. water level, 25 yd. heaped (Condition—Very Good)

TRACTORS and ALLIED EQUIPMENT

14 4—International TD-24 TracTracTor, 80" tread, 22" grouser track shoes, equipped with Bucyrus-Erie Cable-Operated Bullgrader (Rebuilt and Guaranteed)

16 1—International TD-18 TracTracTor equipped with Bucyrus-Erie Hydraulic Angle Blade Bullgrader (Rebuilt and Guaranteed)

EUCLIDS

30 2—Model 70FDT-89W Bottom-Dump Euclid, powered by Cummins NHB-600 Diesel Engine, 24:00x25, 18-ply tires on trailer and tractor drive wheels, Model 34H hitch, air steering, 2 yd. top extensions

31 1—Model 82FD Rear-Dump Euclid, 15-ton, with air booster steering (Rebuilt and Guaranteed)

32 5—Model 38FDT-89W Bottom-Dump Euclid, powered by GMC 6-71 Diesel Engine

AIR COMPRESSORS

35 1—Worthington Model 500' Diesel Compressor, powered by Caterpillar Diesel Engine, mounted on 4-wheel spring towgabout with 7:50x20 tires

ATLAS EQUIPMENT CORP.

635 Ridge Ave., Pittsburgh 12, Pa.
Allegheny 1-6000

FOR SALE OR RENT

LIMA 1201

Shovels Cranes Drag-lines

Located
Trenton, N. J.;
Pittsburgh, Pa.;
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SHOVELS

(Standard or high front)

CRANES

(Up to 120 ft. boom)

Lima Model 604, Combination 1½ yd. Shovel and Dragline. New 1948. Serial 4562. Located Syracuse, N. Y.

Also several 1 H Series D 8 Tractors for sale.

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7 Used, Reading Co., Class GHD
42 Ft Long, 50-Ton Capacity

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5—9FDT EUCLID BOTTOM DUMPS

13 cu. yd. capacity, Cummins Diesel Engines.

Machines are in excellent condition.

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1—NORTHWEST Model 6
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Excellent Condition

HODGE & HAMMOND, INC.
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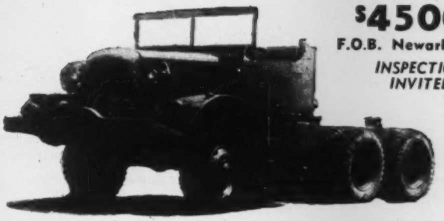
MACK MODEL N.O. 6X6 TRUCKS

Immediate delivery—Army Surplus. Very Low Mileage

Specifications

- —Mack EY Engine (707 cu. in)
- —Duplex Transmission with transfer case.
- —Heavy duty double drive MACK rear ends.
- —25,000 lb. Gar Wood winch.
- —1200 x 24 tires.
- —Air Brakes.
- —Suitable for heavy duty mountings. Shovels, cranes, mixers, dump bodies. Mining and lumber.



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45 TON 12 WHEEL TRANSPORTERS

114" Overall Width
356" Overall Length
(ARMY SURPLUS)

\$2500.00 each
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24 Operating Tires—8.25 x 15"

DOLLY TOW BAR—AIR BRAKES

DAVID B. KAPLUS, INC. U. S. HIGHWAY NO. 1 AT HAYNES AVE.
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3

TERRA COBRAS

(200 H.P. ENGINES)

GOOD OPERATING CONDITION

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TRACTOR & EQUIPMENT CO.
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REINFORCING STEEL—NEW BILLET HYRIB DEFORMED.

200 Tons — 3/4" 800 Tons — 1/2"
50 Tons — 5/8" 100 Tons — 3/8"
50 Tons — 1/4"

Surplus—No priority necessary.
CALL COLLECT

THE H. K. FERGUSON COMPANY
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BUY - SELL - TRADE
your
COMPRESSOR VACUUM PUMP
STEAM BOOSTER

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FOR QUICK SALE

TRANE UNIT HEATERS—USED 4 MONTHS

67 No. 85-H—Capacity 100,000 to 116,000 BTU
61 No. 84-H—Capacity 132,000 to 150,000 BTU
62 No. 82-H—Capacity 90,000 to 104,000 BTU

F & T TRAPS

86—3/4" Hoffman
71—3/4" Armstrong

Approximately 200 Valves as follows:

3/4"—200 lb., 125 lb., 1"—250 lb., 1 1/4"—125 lb., 1 1/2"—125 lb., 2"—125 lb.

ABOVE ITEMS PRACTICALLY GOOD AS NEW

3000 Feet 1" to 2" Std. Black Steel Pipe
also
1—3" Leslie Reducing Valve, Safety Valve and Strainer—200 lbs. to 20 lbs.

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OPEN WEB STEEL JOISTS

1750 PCS. #82 x 12 FT LONG
425 PCS. #167 x 24'-9" LONG
SHIPMENT FROM STOCK

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STOP CHECK THESE USED LISTINGS BEFORE YOU BUY

IHC TD-18 Tractor with Bucyrus-Erie Bulldozer, 74" tread, 20" shoes, excellent buy.

Buffalo-Springfield 3-wheel 10-ton Roller. Reconditioned, gas engine overhauled.

American Vacuum Leaf Loader, gas powered, two-wheel trailer mounted, complete with suction nose. A top buy.

Universal 5-KW Light Plant, Model 6000M, direct current type. A good buy.

IHC TD-18A Tractor with B/E Cabledozer & B/E P-25 Winch, 24" tread, 20" shoes. Don't pass this up.

Austin-Western Badger ½ yard shovel front, like new, ready for use.

Chi-Pneu. Model G-200R Wagon Drill with 60D drifter on pneumatic tired wheels.

Model PAW Mobilift, gas powered shop truck for tote boxes, etc. Priced to sell.

Hough HA Payloader, 10½ cu. ft. bucket, gravity dump, pneu. tires. Remanufactured, ready for your job.

IHC UD-9 Power Unit, starter, controls, on steel sub-base. Rebuilt, perfect shape.

Reconditioned Reliance 10 x 18 Jaw Crusher, twin 48" dia. 6½" face flywheels.

Disston 2-Man Chain Saw, 3" size, gas engine. Completely rebuilt, ready to use.

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New Material—Immediate delivery from stock

3 x 3 x ¼ up to and including 6 x 6 x ¾ Angles
4" I Beams up to and including 36" WF Beams
4" up to and including 15" Channels
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Also all sizes Excellent Used Material

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1 Model 200A P&H Truck Crane, 40' boom
1949 Model 25 NORTHWEST Combination Shovel & Crane
¾ cu yd OWEN Bucket, used 800 hours
SHOVEL FRONT for 255A P&H
SHOVEL FRONT for 150 P&H
New Style TRENCH HOE for 150 P&H
Old Style TRENCH HOE for 150 P&H
Old Style TRENCH HOE for 255A P&H
D4 TOURNAPULL, equipped with AD Tiltdozer
Model 655B P&H, 1-½ yd SHOVEL, clamshell operated, 70' boom
LS51 LINK-BELT-SPEEDER, with Cat Diesel Engine, less than 700 hrs use.
K14 INSLEY Crane and Backhoe
¾ yd P&H 206 Crane, with Generator and Magnet, 40' boom
15 ton Tagalong TRAILER, 9/20 rubber tires, vacuum brakes & controls
1 Model 150 P&H Truck Crane for steel erection 55' boom, 15' jib.

NEW EQUIPMENT FOR SALE

3-½ yd CHALLENGE TRUCK MIXER
PITMAN Hydra-Lift
UNIVERSAL Primary Crushing Unit with TS24 Screen, Jaw Crusher & charging Hopper

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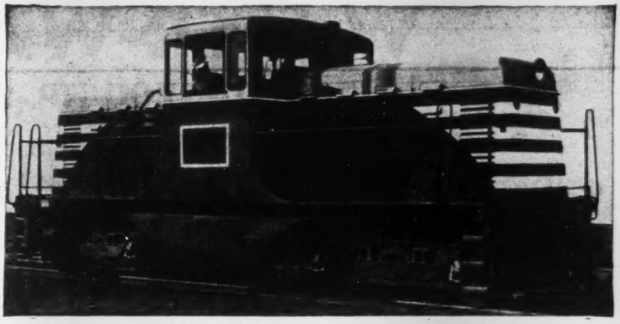

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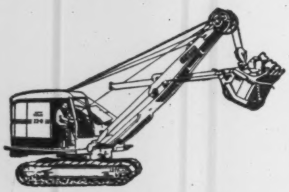

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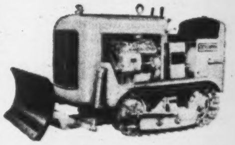

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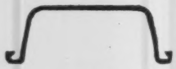

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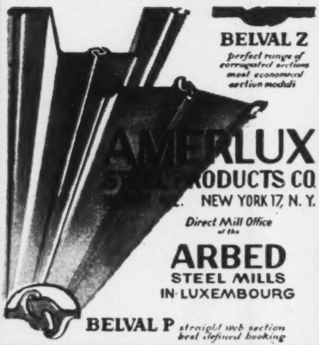
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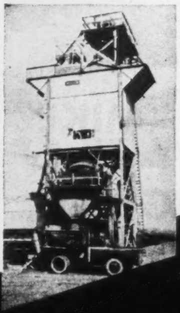

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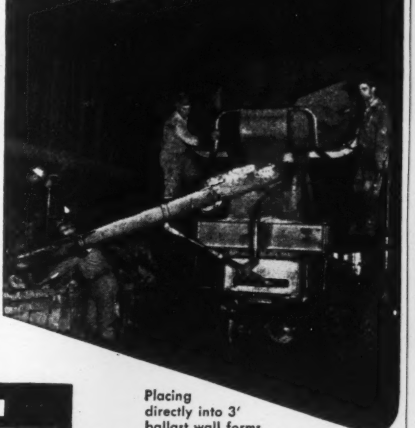

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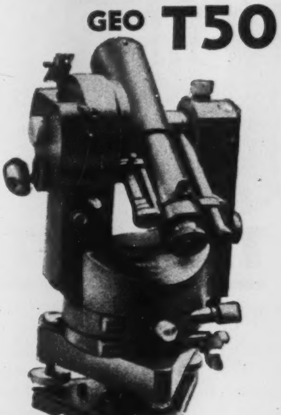

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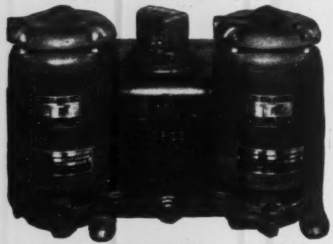

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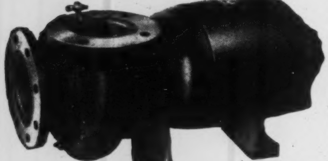

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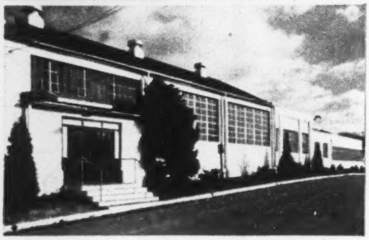

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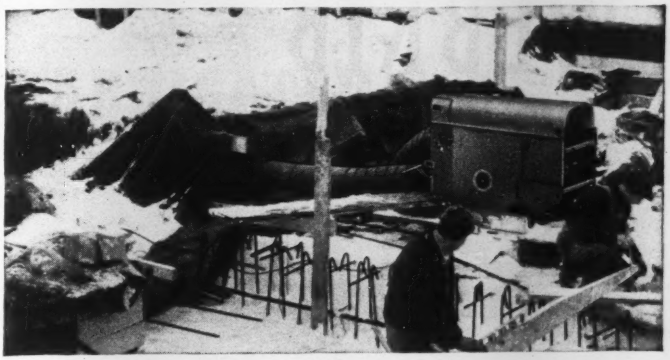

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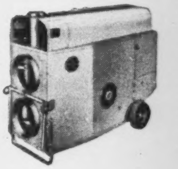

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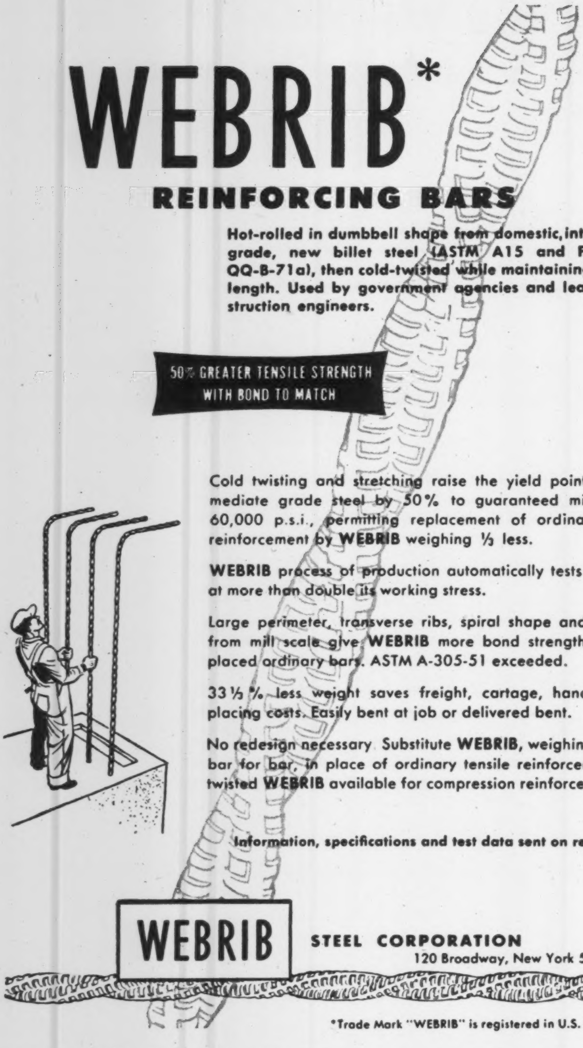

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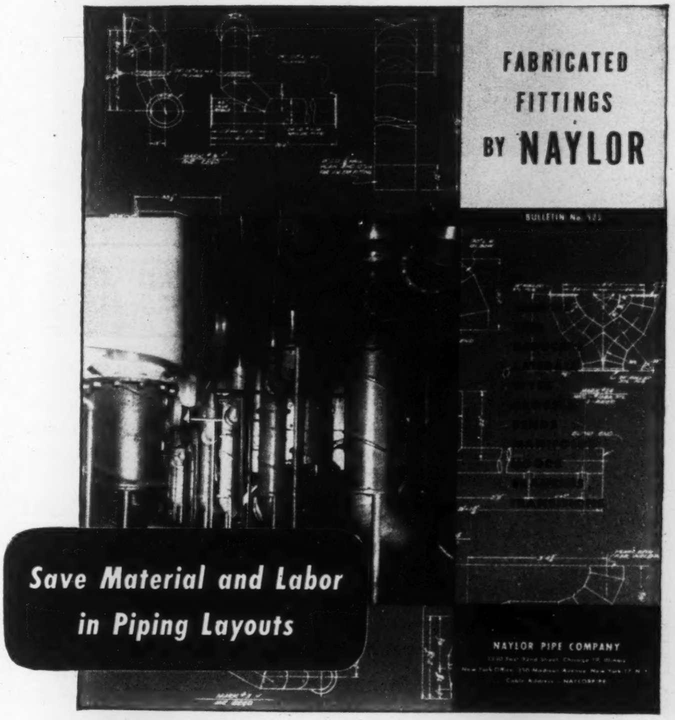
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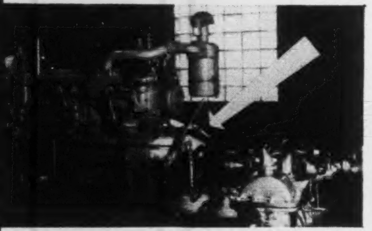

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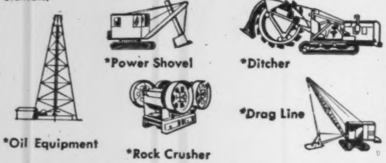

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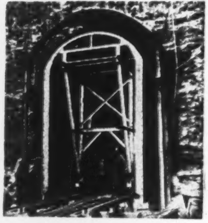

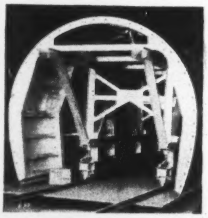

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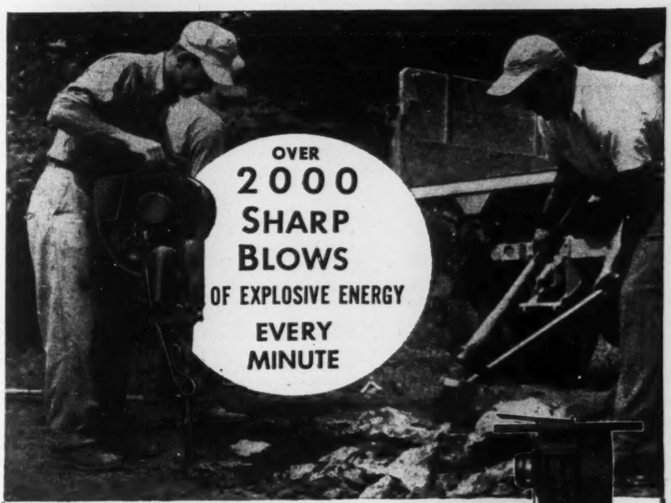

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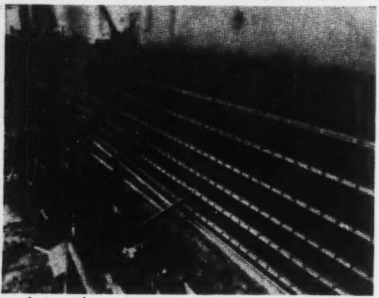

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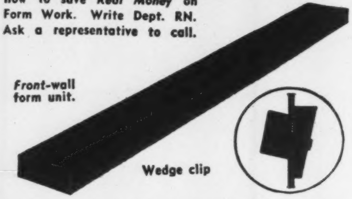

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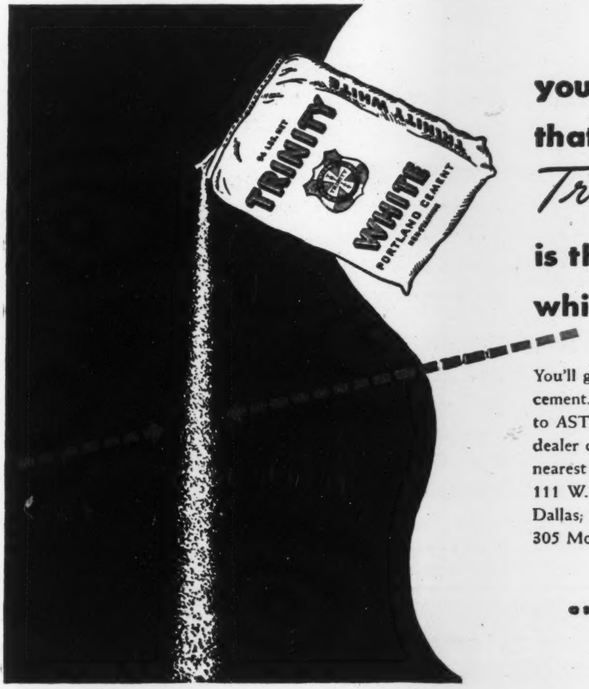

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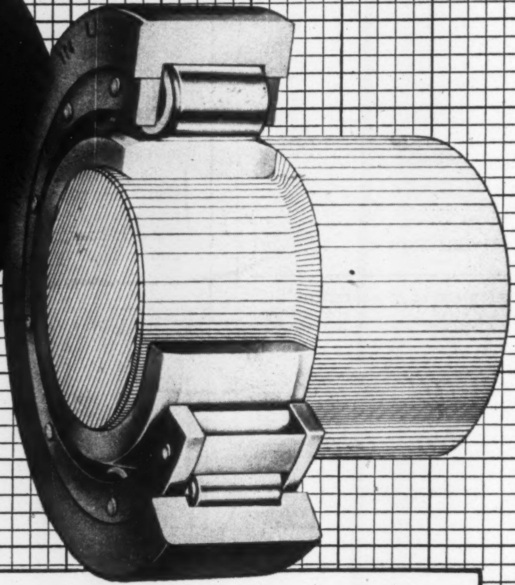

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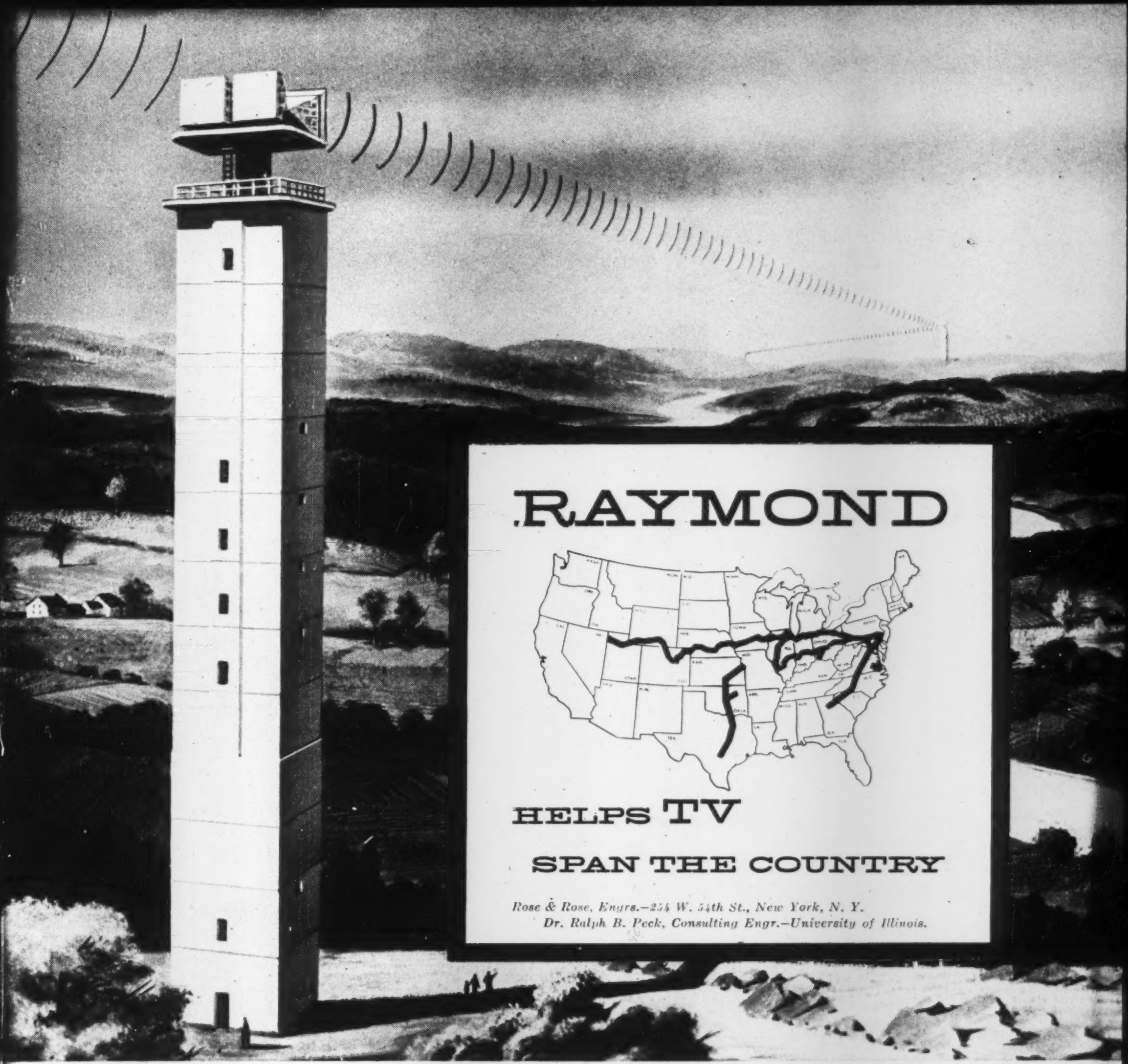

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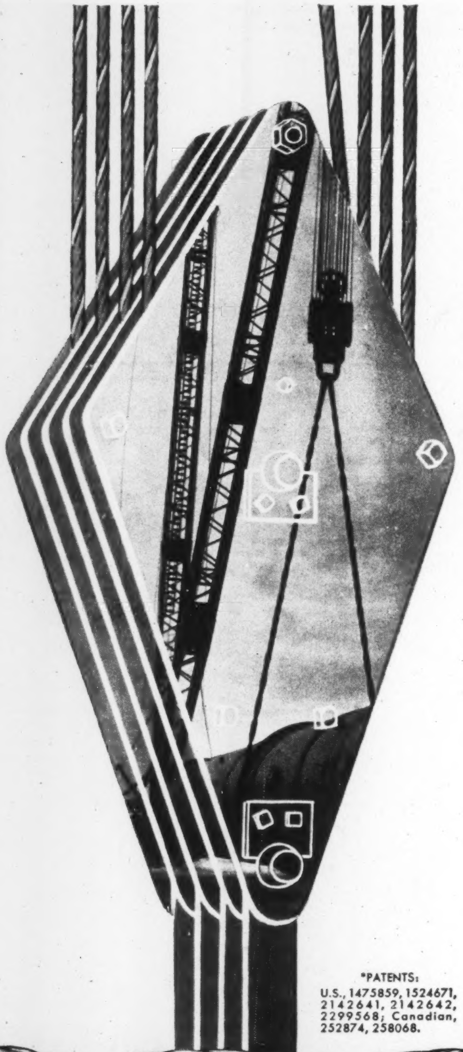

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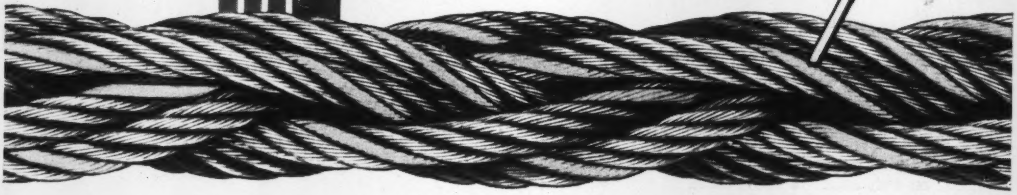

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